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## NEWS SUMMARY

### GENERAL

#### Pope asserts 'force of spirit'

A clear message of encouragement to Roman Catholics throughout Eastern Europe, Pope John Paul declared the "spiritual unity of Christian Europe" in spite of political divisions.

He emphasised the significance of his election as the first Slav pope and said it was Christ's will that a Polish Pope should hold "at this precise moment, manifest the spiritual unity of Christian Europe."

Earlier he told thousands of hearing students in Warsaw that strength was not to be measured by physical force but by the force of the spirit. **Pages 2 and Back.**

### BUSINESS

#### Industry demand now on upturn

INDUSTRIAL demand is now picking up on a broad front, according to two surveys released today, but many companies remain uncertain how long the recovery will last.

The CBI's monthly trends survey shows manufacturers order books stronger in May than all of last year, a finding supported by the Financial Times Business Opinion survey, which charts a further rise in new orders. But the FT survey found that businessmen were less optimistic about further increases over the coming year. **Back and Page 22.**

#### Plot to kill Muzorewa

Bishop Abel Muzorewa, Zimbabwe Rhodesia's new Prime Minister, accused some politicians of "treasonable behaviour" as it was disclosed that the police had uncovered a plot to assassinate him.

The Minister of Law and Order claimed that the detention last week of officials of the Rev. Sithole's Zanu was connected with the murder plot. **Page 2.**

#### Italians vote

Armed police and soldiers guarded 76,000 polling stations as Italians began voting in two-day general elections which are expected to inflict a setback on the Communists for the first time in 30 years. **Page 2.**

#### Turks on trial

More than 800 Turks, including hopkickers, teachers and housewives, face military tribunal in Ankara today on charges connected with bloody sectarian riots in the Kahramanmaraş, in which more than 100 people died.

#### Pakistan riot

Armed and stick-wielding police confronted hundreds of brick-throwing college students in Lahore, Pakistan, where it is feared continuing violence may cause the postponement of the planned November elections.

#### Plague victim

A teen-age youth is in a Los Angeles hospital with bubonic plague, the second case to be reported in Southern California in three weeks, according to the city Health Department.

#### Welensky ill

Sir Roy Welensky, the 71-year-old former Rhodesian Prime Minister, was described as "very ill" in Scarborough General Hospital, north Yorkshire, where he is recovering from a heart attack.

#### Briefly

Two DC-10 jets down by American Airlines experienced mechanical problems on flights on Saturday night, the company said. A close look at the DC-10 story. **Page 15.**

Ashes of Greek opera singer Maria Callas were strewn over the Aegean Sea, fulfilling a wish in her will.

Twenty-one youths were arrested after a series of burning fights on the seafront at Great Yarmouth.

Jacksons of Piccadilly, the Queen's grocers, is to close after 130 years.

#### Financial Times

This issue of the Financial Times has not been printed in Frankfurt because of the public Whitman holiday in Germany today. Copies for FT readers in Europe and the U.S. have been distributed from London.

#### COMPANIES

#### SEARS HOLDINGS

activities have started 1979 satisfactorily, in spite of poor weather and economic conditions, the chairman says. **Page 18.**

### CONTENTS

The Gulf: the clouds gather	14	row over shipping indictment	14
Air safety: a closer look at the OCIO	15	Lombard: Samuel Brittan on a just way to cut public expenditure	15
Justinian: the taxman versus the motorway caterers	10	Canning industry: American company's diversification	12
Editorial Comment: U.S. leadership in energy crisis	16	Survey: Aerospace 16-page pull-out	16

Arts	11	Leaders Page	14	Today's Events	15
Books	11	Letters	14	TV and Radio	15
Base Rates	18	Law	12	UK News	26
Building News	9	Management	12	Weather	26
Businessman's Diary	17	Money & Exchange	14	World News	3
UK Company News	17	Money & Exchange	14	World News	3
Continental	18	Money & Exchange	14	World News	3
Entertainment	10	Money & Exchange	14	World News	3
Financial Diary	17	Money & Exchange	14	World News	3
Foreign News	18	Money & Exchange	14	World News	3
Labour News	8	Money & Exchange	14	World News	3
Technical Page	8	Money & Exchange	14	World News	3

# Saudis will oppose moves to limit oil supplies for West

BY JAMES BUCHAN IN JEDDAH

Saudi Arabia will oppose any attempts to limit supplies of crude oil to the West, and has guaranteed to maintain its present production ceiling, says Sheikh Ahmad Zaki Yamani, the Saudi Oil Minister.

But in an interview published in Riyadh he made no mention of reported Saudi intentions to increase production by 500,000 barrels a day, from the present 8.5m barrels.

In the interview, which constituted a statement of principles for the conference later this month of the Organisation of Petroleum Exporting Countries, the Minister said the Saudis would aim to "prevent any further exacerbation of the energy crisis."

His remarks fall well short of Western hopes that Saudi Arabia would substantially increase production to provide some slack in the tight world oil market.

A shortfall in supply has permitted producers to start a chaotic round of leapfrogging surcharges which have raised the price of some crudes to \$8 above Saudi Arabian light, the OPEC marker, which is now \$14.55 a barrel.

Prices on the spot market—short term crude sales—have reached very high levels.

In the interview, Sheikh Yamani made no reference to a statement attributed last week to Dr. Abdul Hadi Taher, Governor of Petroleum, the State petroleum organisation, that Saudi Arabia was considering raising production by 500,000 barrels a day, but the article suggested that present production levels could come up for revision at the time of the June 26 OPEC meeting.

Dr. Taher said that the production increase might come into force on July 1.

Saudi Arabia has a production ceiling of 8.5m barrels a day. This is an annual average and has been in force on and off since 1973. She raised it to 9.5m barrels a day to make up for losses from Iranian export production, and then stabilised at present levels at the end of March.

Sheikh Yamani has expressed Saudi willingness to raise prices to curb the present pricing spiral. Last month he presented a proposal to the Saudi Cabinet for reunifying the price structure, which would inevitably include some accommodation with the surcharges.

Saudi Arabia would seek to ensure "that a limited number of all companies do not realise excessive profits at the expense of both producers and consumers" a charge made by Crown Prince Fahd at the end of last month.

The chances of other Middle East countries following Saudi Arabia is somewhat limited, even though it produces more than twice as much oil as her nearest competitor.

Above all, Sheikh Yamani's statement is a sign of good will towards the West.

Editorial comment and the shadow over the Gulf, **Page 14**

"Green" palliative, **Page 16**

## IRAN OIL CHIEFS QUIT

THE ENTIRE board of the National Iranian Oil Company tendered its resignation in support of Mr. Hassan Narth, the chairman who is deeply embroiled in a political row with clergymen supporting Ayatollah Khomeini.

The board's resignation letter was passed on to the Cabinet on matter, but is not expected to be accepted. The letter simply said: "The present conditions are such that no real service can be rendered by us."

The present seven-man board of NIOC was only formed a month ago in a reshuffle which dispensed with most of the oil executives carried over from the old regime.

Decline of Iran industry, **Back and Page 3**

# Information scandal may force Vorster to resign

BY QUENTIN PEEL IN JOHANNESBURG

MR. JOHN VORSTER, the South African President and former Prime Minister, is expected to be forced to resign in the wake of a damning report to be published this week on his complicity in the information Department scandal and its attempted cover-up.

The dominant scandal involving alleged maladministration and outright corruption will undoubtedly blow up again after the final conclusions of the Commission, headed by Judge Rudolf Erasmus, on the secret activities of the Information Department are discussed at an emergency Cabinet meeting today. Publication of the report is likely to be brought forward because of leaks of its contents.

It is understood that the commission has reversed its original conclusion that Mr. Vorster was not to blame for the massive misappropriation of State funds by the department under Dr. Connie Mulder, former Information Minister, and Dr. Eschel Rhoodie, the former Secretary for Information.

It accuses the former Prime Minister of lying to the commission and being party to an attempted cover-up of the scandal, and specifically withdraws the "exonerations" granted in its first report last December.

The commission's other major conclusion, it is understood, is that several key operators of the massive secret funds granted for information Department counter-propaganda and dirty tricks—some R64m (\$29m)—were guilty not only of irregularities, but outright corruption. There is, however, no suggestion that Mr. Vorster was himself aware of the corruption.

In its investigations, which began last November shortly after Mr. Vorster's resignation as Prime Minister, the Erasmus commission has unravelled a complex series of "front companies" operated with information Department secret funds, and has studied transactions in private bank accounts, including those of Dr. Rhoodie.

The sort of secret operations already uncovered were the part-financing of an attempted takeover in the U.S. of the Washington Star newspaper at a cost of \$10m; the financing of an attempted takeover of the British publisher Morgan Grampian, which was equally abortive; and the funding of a supposedly independent English-language newspaper in South Africa, the Citizen, costing some R32m (£19m).

All told, more than 130 secret operations were identified, most of which have been kept secret. It is believed that Mr. P. W. Botha, Mr. Vorster's successor as Prime Minister, has accepted that his predecessor must be sacrificed in order to defuse the information scandal once and for all.

Nationalist sources hope that further Probe exposure of corruption in the Government will be controlled by the legislation going through Parliament to create an advocate general, who will be able to bar further revelations. The only question is just how and when Mr. Vorster will go.

The Government faces a key test of its position on Wednesday with the by-election in Dr. Mulder's former constituency, the mining town of Randfontein. In spite of an expected abstention from Dr. Mulder's supporters, and a swing to the Right from white miners disgruntled at the proposed liberalisation of the labour laws, there is not thought to be any serious threat to the ruling National Party.

Although the information affair has, therefore, not had any immediate dramatic effect on the overwhelming support for the National Party from the white electorate, it has opened up serious divisions within the Party itself, and the demise of Mr. Vorster can only aggravate them.

Dr. Mulder, once the second most powerful man in the Party, is also not showing his hand on any future moves since he was expelled from the Party for his part in the scandal.

# UNCTAD fails to find common ground on most major issues

BY PHILIP BOWRING

AFTER SEVERAL days of increasingly feverish negotiations ending in an all-night session yesterday, the fifth United Nations Conference on Trade and Development failed to reach agreement on most of the major issues it tackled.

Following four weeks of grilling talks the rich and poor nations at the UNCTAD meeting failed to agree a resolution on the item at the top of the agenda—the restructuring of the world economy.

There was also no agreement on a number of other important—though less ambitious—items covering money, debt, trade preferences for developing countries, the multilateral trade negotiations and shipping.

However, the meeting did call for an end to the spread of protectionism and concluded agreements on commodities and on more help for the least developed countries. The world's 30 poorest countries will get immediate aid and member countries agreed to double their aid "as soon as possible."

The 3,000-plus delegates at the meeting began to leave Manila with the general feeling that the meeting had not been a success. Even hardline developed countries, who persistently warned developing countries against expecting too much from such gatherings, admitted that progress had at best been modest. Some delegates, especially from Africa, were pessimistic and irritated by what they saw as successful stonewalling by the rich.

The resolution on protectionism, which has been the most talked about issue of the conference, is seen as unexceptional but worthwhile. It condemns the phenomenon and agrees that structural adjustment is needed in developed countries to ensure an "effective international division of labour."

It stops well short of original Group of 77 demands for new mechanisms to regulate protectionism and to direct adjustment processes within the industrialised world. The Group of 77 is made up of 119 developing countries who coordinate their joint strategy.

The resolution on least developed countries provides for short and long term "action programmes." Whatever happens to official aid flows, the resolution effectively commits developed countries to increase the percentage of their aid going to the poorest.

A resolution was also adopted reaffirming the need to progress towards the aid target of 0.7 per cent of GNP. However, several countries expressed reservations, including Britain, which said it could not make any commitments on increased aid levels pending the outcome of its review on public spending.

The Integrated Programme for Commodities received a shot in the arm from a resolution to establish a framework for a programme on processing, marketing and distribution of commodities.

The conference also agreed a resolution on economic co-operation between developing countries which had been affected by the developed countries' insistence on the principle of the universality of UN institutions. A compromise form of words was reached.



Sir Geoffrey: political balance

# Howe may free 1m from tax

BY DAVID FREUD

SIR GEOFFREY HOWE, the Chancellor, is likely to carry out the previous Government's plan of raising income tax thresholds in next week's Budget enough to take 1m people out of the tax net altogether.

Such a move would put personal allowances up by about a third more in the April caretaker Budget, costing an additional £600m in lost revenue.

The higher thresholds are seen as providing political balance in a package whose main thrust is expected to favour the better-off.

Furthermore, they would allow the Conservatives to claim that they had matched the election pledge to the worse-off by Mr. Denis Healey, the previous Chancellor, while still putting through their own programme.

The raised allowances will have to be accommodated without raising the public-sector borrowing requirement beyond the target level of about £8.5bn in this financial year.

Reports last week that the borrowing requirement would be at least £12bn on unchanged policies, are discounted by Whitehall officials in favour of the £10.5bn figure disclosed by Mr. Healey a fortnight ago.

In the caretaker Budget Mr. Healey put up allowances in line with the rise in the retail price index, as he was obliged to do under the Rooker-Wise amendment to the 1977 Finance Act.

The increase, 8.9 per cent, goes into force backdated in August unless modified by Sir Geoffrey.

# Action threat by leaders of engineers

BY PHILIP BASSETT, LABOUR STAFF

ENGINEERING UNION leaders gave a warning yesterday of industrial action if improvements due this week in a pay offer to more than 2m workers are unsatisfactory.

Mr. Terry Duffy, president of the Amalgamated Union of Engineering Workers, the largest union in the central negotiating body for the industry, said that if a new pay offer to be put forward on Tuesday was still unsatisfactory, the "initial onslaught" of industrial action might take the form of an overtime ban and possibly selective strikes.

Mr. Duffy left the last round of negotiations with the Engineering Employers' Federation with a warning that the two sides were "collision bound."

His militant stance was echoed yesterday by Mr. Gavin Laird, a union executive member, who, although less pessimistic than some leading officials on the outcome of the negotiations, said that if negotiations broke down this week, there was a "distinct probability" that action, including an overtime ban, one-day stoppages and further selective strikes, would take place.

If the offer is unsatisfactory, the warning is likely to be given next week by a recalled meeting of the union's policy-making national committee.

The Confederation of Shipbuilding and Engineering Unions, the umbrella body for 15 unions in the industry, has been more cautious than the AUEW in warning of the implications of a breakdown in negotiations.

The AUEW, though, is far the largest member union, and if the question of action was so undecided as to come to a vote, a decision would almost certainly follow AUEW policy.

Widespread national industrial action is difficult for union leaders to mount in the engineering industry because the complex two-tier negotiating structure allows local negotiations to determine actual earnings and makes the national agreement largely academic to many union members.

After consultation with member companies, the employers' federation has indicated that it is prepared to make a "modest improvement" on Thursday. However, senior federation officials have made clear that the improvement will be small.

The unions rejected the federation's offer tabled early last month to increase the craftsman's national minimum rate by £5 to £65 a week.

The unions are seeking new national basic rates for craftsmen of £80 with proportionate rises for other grades. Local negotiations mean that most engineering workers receive more than the national minimum rates, but they are used in the calculation of overtime and premium payments.

An improved offer to 95,000 power workers is likely to be made in negotiations this week, and if union officials judge the improvements sufficient they may put it to ballot. **Power Continued on Back Page**

# \$77m transatlantic lorry building link abandoned

BY DAVID LARCHELLES IN NEW YORK

A PROPOSED \$77m transatlantic link between two heavy vehicle makers, MAN of West Germany and White Motors of the U.S. was cancelled yesterday after the two companies agreed that the benefits might be less than originally thought.

Mr. S. E. Knudsen, chairman and chief executive of White, said the decision had been taken "after top executives of both companies met and conducted a wide-ranging re-appraisal of the proposals."

He went on: "From this it became apparent that the synergistic benefits would be significantly less than we had originally anticipated."

MAN and White had been negotiating the link-up since the middle of last year, seeking a deal in which they would exchange technology, then design, assemble and sell lorries in North America, using MAN and U.S.-owned components.

Originally, MAN was to have made a \$15.6m investment for a 12.5 per cent share in White. But in February, MAN agreed to buy a majority share in White for \$77m.

MAN's motives in seeking the deal were to secure a foothold in the U.S. heavy-vehicle market. White, on the other hand, is weak in capital and has been seeking outside participation.

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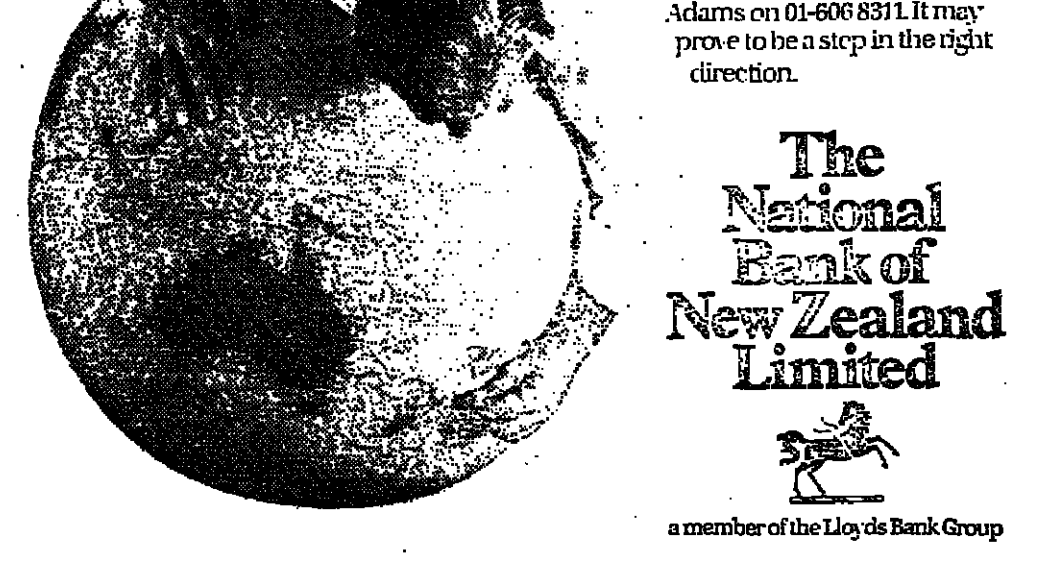
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OVERSEAS NEWS

# Army guards Italy polling booths

BY RUPERT CORNWELL IN ROME

VOTING BEGAN yesterday in Italy's eighth post-war general election. The first results should be known a few hours after the 78,000 polling stations close at 2 pm local time today.

Police and troops were guarding the stations to prevent any terrorist disruption of voting. But by mid-afternoon no serious incidents had been reported, while turnout was around 2 per cent down from the previous general election in June 1976 at a similar stage.

The country's 42.2m electors over 18 years of age, including many migrant workers resident abroad and some 2.5m first-time voters will be choosing 630 members for the Chamber of Deputies and 315 senators, following the dissolution of Parliament at the start of April more than two years ahead of schedule.

A few violent acts however did mar the eve of polling. In Trieste a Communist party worker was attacked, and two of the party's branch offices burnt. Other incidents were reported in Rome and in the southern university town of Cosenza.

A campaign which has failed to capture the imagination is not expected to produce any very dramatic shift in voting patterns. However, opinion polls predict that the long-ruling Christian Democrats will add a point or two to their 1976 score of 38.7 per cent.

On the other hand it is generally forecast that the Communists could suffer a loss of 2 per cent or more from their record 34.0 per cent at the last election. It would be the party's first such reverse for 30 years.

A sign of the public's disillusion has been the attention attracted by the unpredictable Radical Party, which many observers believe may even triple its 1976 total of 1 per cent of the popular vote.

# Brussels facing bankruptcy

By Giles Merritt in Brussels

BRUSSELS IS facing a bankruptcy crisis which, according to observers, is similar to that which besets New York. The Belgian capital's administration was unable to pay its employees at the end of last week and emergency funds had to be arranged to cover hardship cases.

The city, which likes to style itself the capital of Europe, is reported to have spent its anticipated revenues for both 1979 and 1980, and is now unable to meet its current commitments. M. Wilfried Martens, the Belgian Prime Minister, has personally intervened and helped to arrange bridging finance of BFR 110m (\$1.9m) to the salaries of the city's 2,400 employees.

M. Gaston Geens, the Finance Minister, has been made responsible for setting up further emergency funding. One of the chief problems he is expected to face will be negotiation of the terms of the state guarantee that the financial institutions will accept. The size of the loan required immediately by the Brussels authorities is unknown, although some estimates put the first tranche alone at BFR 990m.

Fundamental to the city's bankruptcy crisis is the Belgian system for administering municipal finances. The banker to Belgium's communes is the Credit Communal, but it has apparently become seriously over-stretched by the demands of Greater Brussels.

# Malta Premier accuses Libya

By Godfrey Grima in Valetta

Mr. Dom Mintoff, Malta's Prime Minister, on Saturday night accused Libya of "pulling Malta's leg" in the protracted negotiations over territorial waters.

Malta needs agreement on territorial waters to avoid problems with Libya when it starts drilling for oil in what is reputed to be a promising zone.

Talks have been going on for three years, and at one time Col. Muammar Gaddafi, Libya's leader, agreed to have the dispute settled by the International Court of Justice. Libya's unwillingness since then to come to an agreement with Malta has exasperated Mr. Mintoff, but Saturday night's remarks were the first public acknowledgement of differences with Libya.

# Thousands greet Pope on 'pilgrimage' to Poland

BY ANTHONY ROBINSON, EAST EUROPEAN CORRESPONDENT

WAVE AFTER wave of applause swept through a vast audience of students and young people outside Warsaw's Church of Saint Anne yesterday as Pope Paul II told Poland's youth it was not by physical force but by the openness of heart "filled by the Holy Spirit" that man was to be measured.

The crowd surged through the streets to Victory Square, to wave to the Pope as he flew off in a white helicopter to continue his pilgrimage to the shrines and holy places of his motherland.

The papal visit began on a note of deep emotion as his Holiness bent to kiss the native soil on his arrival at Warsaw Airport. He embraced the Cardinal Primate of Poland Mgr. Stefan Wyszyński and, in reply to the welcoming speech by the Polish Head of State Mr. Henryk Jablonski, underlined his gratitude at being allowed to

make the visit (denied to his predecessor Pope Paul VI) and the "purely religious motives" of his pilgrimage. He added: "I desire that the fruit of this visit may be the internal unity of my fellow countrymen and also a further favourable development of the relation between State and Church."

But the way in which religion and the Catholic Church are inseparable from wider issues of politics and Polish history is the crucial motive of his visit so far. Thus he began his reply to the welcoming speech of Communist Party First Secretary Mr. Edward Gierek at Warsaw's Belvedere Palace by recalling the words of Pope Paul: "A Poland that is prosperous and serene is also beneficial for tranquility and good collaboration among peoples of Europe."

References to Poland's history were a common theme

into the speeches of both Church and State leaders. But Mr. Gierek spoke of "alliance, friendship and co-operation with the Soviet Union" as the safeguard of Socialist Poland's "independence, sovereignty and security." The Pope, during his sermon in Victoria Square, recalled the bitter days of the Warsaw uprising in 1944 when Poles "undertook an unequal battle against the aggressor, a battle in which it was abandoned by the allied powers." Earlier he told Mr. Gierek, State and Party leaders at the Belvedere Palace that "peace and the drawing together of peoples can be achieved only on the principle of respect for the objective rights of the nation such as the right to existence, to freedom, to be a social and political subject and also to the formation of its own culture and civilisation."

# Palestinians warn Sadat supporters

By Ihsan Hijazi in Beirut

PALESTINIAN guerrillas, who claimed responsibility for the assassination of an Arab notable in the Israeli-occupied city of Gaza, have threatened to take similar action against any Arab who co-operates in negotiations on the proposed autonomy in the Gaza Strip and the West Bank of the Jordan.

The murder of Sheikh Hashim Khuzandar, the "Imam of Gaza" last Friday night, has been claimed by the headline Popular Front for the Liberation of Palestine (PFLP).

Sheikh Khuzandar was known to have supported President Sadat's peace initiative and the Egyptian-Israeli treaty. His murder followed speculation that the Egyptians and Israelis had been trying to get Sheikh Khuzandar and Mr. Rashid Shawa, the mayor of Gaza, to join the autonomy negotiations which are to be resumed in Alexandria on June 7.

L. Daniel adds from Tel Aviv: Teams in Jerusalem and Cairo are getting ready for the start of negotiations between Egypt and Israel on the normalisation of relations between the two countries and the shape and content of the proposed autonomy for the West Bank and Gaza. Three Israeli Cabinet Ministers, including Mr. Moshe Dayan, the Foreign Minister, will visit Egypt within the next ten days.

Meanwhile, Premier Menachem Begin is facing a challenge from within his own "Herut" faction of the Likud Government. A three-day conference of 1,000 Herut delegates was due to meet late last night. The party's firebrand, Mrs. Golda Meir, has already announced she will not attend, and a new party is about to be formed led by one of Israel's most esteemed scientists, Prof. Yuval Ne'eman, who considers that Herut, and Likud as a whole, is abandoning Herut's principles by its concessions.

# New UAE government delayed

BY RICHARD JOHNS

THE DEADLINE for the formation of a new Government of the United Arab Emirates passed here in Dubai yesterday without agreement on its make-up.

Sheikh Zayed, president of the UAE and ruler of Abu Dhabi, has still not approved the list of names originally submitted nearly a fortnight ago by Sheikh Rashid, the ruler of Dubai, who undertook to become Prime Minister and form a new administration as long ago as April 30.

The meeting of the Supreme Council, including the other five Emirs of the Federation, which was scheduled for yesterday to approve the new Cabinet, did not take place.

It is understood that Sheikh Zayed has reservations about

one of the names proposed by Sheikh Rashid, and also the positions designated to two others by him.

At the same time, they have agreed that two Sharjas in the outgoing Cabinet, Mr. Abdullah Omran Taryam and Mr. Khalifan Al-Roumi, who held the education and health portfolios respectively, will be dropped.

Despite the failure to meet the deadline, there is no atmosphere of crisis. On the contrary, relations between Sheikh Zayed and Sheikh Rashid seem to be exceptionally cordial at present.

When he accepted his mandate, Sheikh Rashid was given carte blanche by the president to form an administration of his own choosing, so that the paralysing crisis over the form

of the federation could be overcome. This was in accordance with suggestions made by Sheikh Sabah Al-Ahmed Al-Sabah, the Kuwaiti Foreign Minister, who attempted in April to mediate between the two leading figures in the union.

Sheikh Rashid has committed himself to making over half his oil revenues, which this year should amount to some \$1.75bn, available to the common budget. But his assumption is that most, if not all, of his money will be devoted to federal services in Dubai, for which he has in the past been responsible.

These services include the Dubai defence force (nominally part of the NAE armed forces), the police, electricity, water, his own municipal administration, and TV and radio.

# Egypt bid to save arms industry

BY ROGER MATTHEWS IN CAIRO

EGYPT IS EXPECTED to launch a last-ditch effort this week to rescue something from the threatened collapse of the billion-dollar Arab arms industry. Mr. Hosni Mubarak, the Egyptian Vice-President, is planning to visit both Washington and London soon and is expected to urge President Carter and Mrs. Margaret Thatcher to continue support for the Arab Organisation for Industrialisation (AOI).

In a letter to the British Government last week Crown Prince Fahd of Saudi Arabia spelled out the intention of his country, together with Qatar and the United Arab Emirates, to dissolve the AOI, of which Egypt is the fourth partner. The three Gulf members—which broke relations with Egypt after the signing of the peace treaty with Israel—are scheduled to meet in Paris this week. Egypt is not expected to be present, although Egyptian AOI officials may be there.

The AOI was set up four years ago with the Gulf states providing the funding and Egypt the facilities and a 15,000 labour force for the production via joint-venture companies of Jeeps (with American Motors), Lynx helicopters (with Westland), Swingfire anti-tank missiles (with the Dynamics Group of British Aerospace), and later fixed-wing aircraft with Dassault-Breguet of France.

Mr. Mubarak, a former air force commander, is understood to be additionally concerned as it was planned for the AOI to take on increasing responsibility for keeping the backbone of the Egyptian air force—nearly 200 Soviet MiG-21s—in operational condition. Already Egypt's MiG-23s have been grounded owing to lack of spares and the same fate is threatening a growing number of the MiG-21s, many of which are due for major overhauls.

The other three states withdraw, but the first action to halt building operations appears to have been taken. The AOI is understood to have instructed two British companies, Laing and Cementation, to cease work at least temporarily on the new factory going up for Arab-British helicopters at Helwan, south of Cairo. A clause in the contracts with the two companies is believed to provide for a halt of up to three weeks.

Although funding is probably available to keep the helicopter venture operational for some months, Westland must be most deeply concerned about the viability of the project if the Arab market is lost because of the boycott on Egyptian Arab-British Helicopters had planned to produce some 250 Lynx, of which nearly half would have been exported.

Egypt has frozen AOI funds held in Cairo, although it has now unblocked the accounts of the joint-venture companies.

# Minister alleges ZANU plot to kill Muzorewa

BY TONY HAWKINS IN SALISBURY

ZIMBABWE RHODESIA'S majority rule Government of Bishop Muzorewa's begins its second week in office today with two tough warnings to political rivals of swift retribution if the law is broken. The new Prime Minister himself in a nationwide radio and TV broadcast accused some leading politicians whom he did not name of "mischievous, irresponsible, make-it-arrangeance and I might even go so far as to say, treasonable behaviour."

Even as the Bishop was speaking his Minister of Law and Order, Mr. Francis Zindoga, revealed that police had uncovered a plot to assassinate the new Prime Minister. Mr. Zindoga alleged that the detention of a "official" of the Reverend Ndabaningi Sithole, ZANU was connected with the murder plot. He said the ZANU men had planned to kill the Bishop and some of his "henchmen."

The Rev. Sithole denied the charges and a party spokesman accused Mr. Zindoga of "irresponsibility" in making public such accusations when

the police were still investigating the matter.

Meanwhile security force officials said that the ZANU men arrested last week were suspected of hoarding arms.

In a second nationwide broadcast last night Mr. Zindoga said the new Government "will not hesitate to act against those who, by unconstitutional means, may seek to destroy what has been achieved by the people through the ballot box."

In his address the Bishop revealed that since the April elections he had sent messages to the leaders of the frontline states advising them that the country now had a popularly elected majority rule government. He said he took as a "negative reply" the fact that these countries and especially Zambia and Mozambique were still allowing their countries to be used as bases to overthrow his Government.

Meanwhile it has been revealed that several U.S. State Department envoys had visited Salisbury, but talks with the bishop in the past week.

# Soviet aid for India steel plant

By K. K. Sharma in New Delhi

THE INDIAN Cabinet has approved a proposal for a 3m-tonne steel plant to be built at Vishakhapatnam, in Andhra Pradesh, south India, with Russian assistance. The plant requires an investment of Rs. 22,368m (£1.4bn) and will start producing steel within four years.

This is the biggest single investment decision by the Janata Government, and because of the magnitude of the project and the scale of resources mobilisation, it will be undertaken in two stages.

The initial capacity in the first stage will be about 1.2m tonnes. It will be the third Soviet-aided steel plant in India (the others are at Bhilai and Bokaro).

The foreign exchange component of the project is estimated at around Rs. 5bn. It is hoped to obtain this from existing rupee credits committed by Russia.

India now imports 1m tonnes of steel a year. The Government has plans for two more steel plants, at Mangalore in Karnataka state, and Paradip, in Orissa state.

# Mexico trade deficit rises

BY WILLIAM CHISSETT IN MEXICO CITY

MEXICO'S trade deficit in the first quarter of this year was \$500m, 54 per cent higher than the same period in 1978, according to the leading private bank Banamex. The bank estimates that the year-end deficit will be \$2.6bn compared to \$2.2bn last year.

The figures confirm the sharp increase in imports and the failure of non-oil exports to make any substantial headway. Public sector imports increased in the first three months by

over 70 per cent compared to the same period last year. Private sector imports rose by 40 per cent.

Such levels are indicative of the expansion plans being made in industry as a result of the greatly improved economic climate since the devaluation of the peso in 1978. But industry is not yet exporting very much more.

Exports increased overall by 49 per cent in the first quarter. Non-oil exports rose, however, by only 24 per cent.

# More Afghan refugees flee

By Chris Sherwell in Islamabad

THOUSANDS of refugees from the fighting in Afghanistan have crossed the frontier into Pakistan over the past ten days, swelling the numbers to nearly 100,000.

The influx is an indication of the growing intensity of the running guerrilla war being waged by Afghan Muslim rebels against the Soviet-backed Government of Mr. Taraki in Kabul. The previous figure of 85,000 was given less than a fortnight ago.

# Long-term optimism on tankers

By Ian Hargreaves, Shipping Correspondent

A BOOM in oil tanker freight rates is possible in the years 1982-85, according to Terminal Operators, the London consultancy company.

In its annual review of world oil markets, the consultant emerges with a forecast which is in flat contradiction to many gloomier projections, especially from within the oil companies, in the last two years.

Terminal Operators believes that the current level of ship scrapping and the prospect of reasonably steady trade growth will produce higher seaborne crude oil movements, which it expects to rise by 3.8 per cent between 1977 and 1982.

This, the authors argue, will move tanker supply and demand into general balance in 1982, with an even earlier recovery in demand for smaller crude tankers and for oil product carriers.

The fact that three remain serious short-term uncertainties about the world economy and oil trades will tend, Terminal Operators believes, to make shipowners cautious about ordering new ships.

There is a need, according to the report, for example, for a 50 per cent increase in the product carrier fleet in the review period.

Terminal Operators thinks that owners will be particularly cautious in ordering larger tankers, when the demand for such vessels returns after 1982, "particularly if prospective owners see a risk in the possible exhaustion of world oil reserves before their investments can be fully amortised."

\* World Oil Demand and Tanker Markets to 1982, Terminal Operators, Rodwell House, Middlesex St., London E1 7HL. £65 (UK), £67 (overseas).

# World Economic Indicators

		RETAIL PRICES					
		Apr 79	Mar. 79	Feb. 79	Apr 78	% change over previous	Index base year
UK	000s	214.2	210.6	208.9	194.6	10.1	1974=100
U.S.	000s	211.5	209.1	207.1	191.5	10.4	1967=100
Holland	000s	124.9	124.2	123.0	119.8	4.2	1975=100
Italy	000s	148.3	146.1	144.3	129.9	14.3	1976=100
Japan	000s	125.7	124.0	123.0	122.5	2.6	1975=100
West Germany	000s	149.2	148.2	147.7	139.7	3.3	1970=100
Belgium	000s	131.4	131.3	130.9	126.7	3.7	1974=100
France	000s	213.0	211.1	209.7	193.4	10.1	1970=100
		UNEMPLOYMENT					
		May 79	April 79	March 79	May 78	% change over previous	Index base year
UK	000s	1,306.7	1,310.9	1,350.5	1,364.4	5.7	1974=100
W. Germany	000s	873.5	875.7	957.7	1,134.0	4.4	1,000.4
Holland	000s	3.8	4.2	5.0	208.5	4.8	208.5
France	000s	208.2	209.75	211.1	208.5	4.8	208.5
U.S.	000s	5.0	5.1	5.2	1,105.7	5.1	1,105.7
Japan	000s	1,290.6	1,313.0	1,341.9	1,105.7	5.1	1,105.7
Belgium	000s	5.6	5.7	5.8	5,983.0	5.1	5,983.0
Italy	000s	5,900.0	5,871.0	5,881.0	5,771.0	4.0	5,771.0
U.S.	000s	1,240.0	1,350.0	1,210.0	1,230.0	2.2	1,230.0
Japan	000s	2.2	2.1	1.9	2.2	2.2	2.2
Belgium	000s	301.0	303.1	300.9	284.1	7.1	284.1
Italy	000s	7.5	7.5	7.5	7.1	7.1	7.1
U.S.	000s	1,632.0	1,651.0	1,648.0	1,527.0	8.0	1,527.0
France	000s	8.1	7.5	7.5	8.0	8.0	8.0

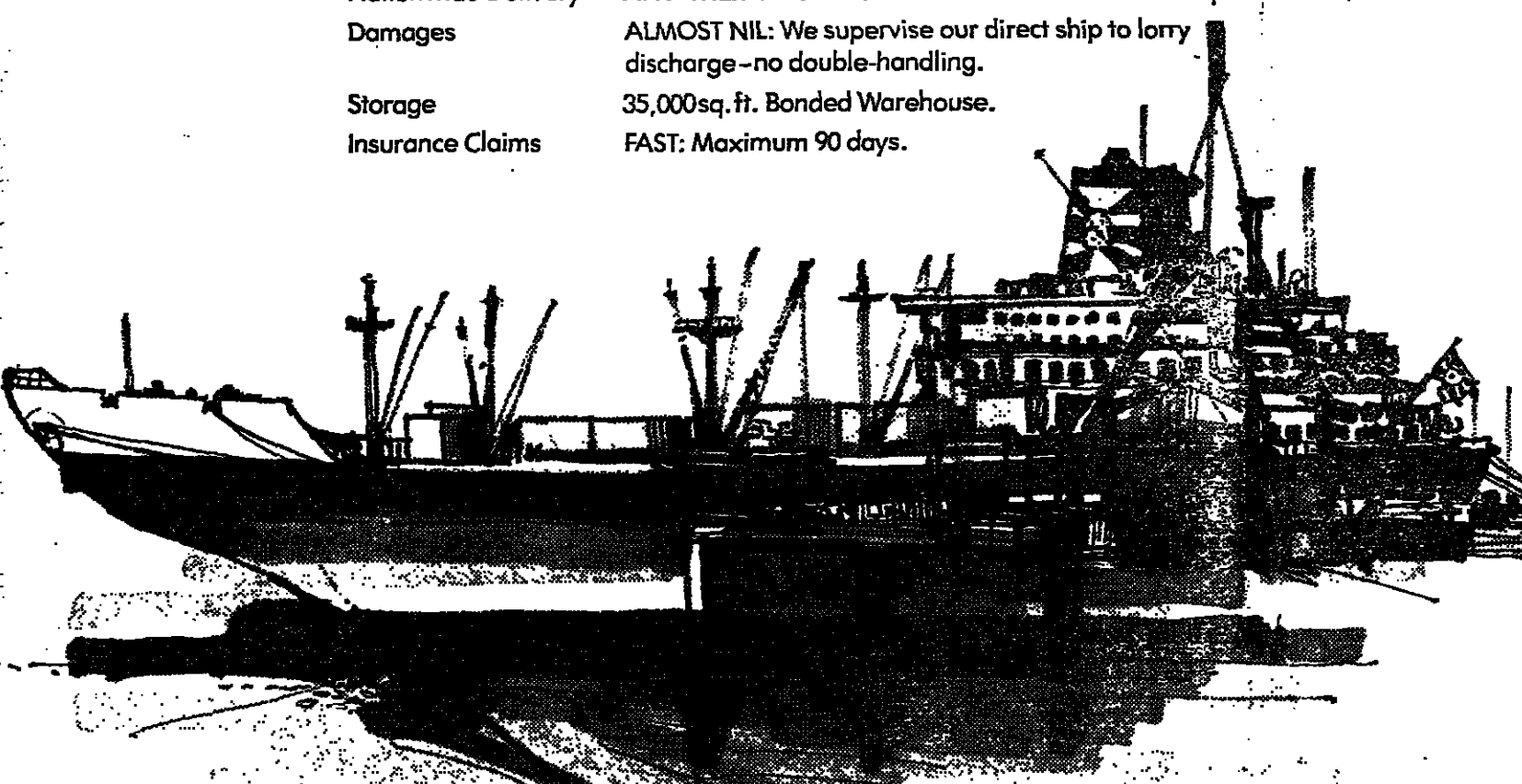
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السوق المالية



WORSENING FINANCIAL DILEMMA

BY ANDREW WHITLEY IN TEHRAN

# Iran's industrial plans in ruins

LITTERED ACROSS the Iranian countryside are the hulks of hundreds of unfinished or unusable development projects. At one Western ambassador commented bleakly, surveying his country's wrecked hopes, "Iran has become an industrial cemetery."

Less than a year after the civil disruption of the anti-Shah movement brought most site work to a halt, it is clear that the highly ambitious development programme designed to catapult Iran into the ranks of the world's top 10 nations is in ruins.

Sifting through outdated project lists to salvage what is possible the new bureaucrats of the Islamic republic apply homespun criteria—combining the fashionable Western virtue of "small is beautiful" with an Islamic puritanism engendering a simpler life.

An Iranian energy expert, who used to be a foremost advocate of nuclear power, summed up this personal and national metamorphosis recently by writing in a scholarly paper that the two giant nuclear power stations nearing completion at Bushire on the Gulf should be turned into grain silos.

Joking apart, the Shah's scheme for an installed nuclear capacity of 24,000 megawatts by 1994, supplying half the nation's energy needs, epitomised the breathtaking scale of the grand vision, in which considerations of cost-effectiveness were relegated to the sidelines.

But alongside the political opposition to dictatorship came a heated gut reaction within the administrative elite itself to the very philosophies of excess, breeding a strong anti-nuclear lobby among those very Western-educated technocrats the Monarch had relied on to carry out his dreams.

The failure of the Shah's hopes for industrial take-off through massive injections of capital and foreign technology is also, in part, the failure of the Western multinationals to restrain themselves or their eager clients from indulging in inappropriate schemes.

The oil producers of the Gulf provided an unprecedented opportunity, as an industrial test-bed and as a source of potentially massive profits. But in the case of Iran the consequence has also been a level of losses unprecedented in business experience world-wide, short of a major natural disaster or a global war.

On conservative estimates, the likely loss of business for foreign concerns, only on major civilian projects in Iran, will be nearly \$38bn (£18.6bn). Less readily identifiable defence contracts, and smaller scale industrial and infrastructure work—would probably double that figure. Britain and the U.S. have been the hardest hit because of their heavy defence exposure, but the other industrialised countries have also all suffered badly.

The revolution caught Iran when its development effort was at its peak in terms of projects under construction. Some date back nearly a decade but only moved off the drawing board when the quadrupling of oil revenues in 1973-74 gave new life to the five-year plan. The plan period ended in March, 1978, but bottlenecks and other constraints delayed completion of a high proportion of projects. Eventually they were caught up in the revolution and left to the mercy of a new regime and a very different economic climate.

Eighteen months ago the National Iranian Oil Company was talking in terms of building a new 200,000 barrels-per-day

refinery every two years to meet rocketing domestic demand and to export a higher proportion of oil products. The Isfahan refinery, under construction by Thyssen of West Germany and Fluor of the U.S. was an essential element in its plans. Today the refinery stands 95 per cent complete, and the contractors are anxious to finish it off, but NIOC is said to be giving it a low priority.

## Abandoned

The key highway linking north and south Iran, the 1,150 mile Qom-to-Bandar Shahpour road, is almost certainly being abandoned. Estimated to cost \$2.4bn, the first contract worth more than \$700m for this badly needed road was awarded last year to a consortium of America's Morrison-Knudsen and France's Jean Lefevre companies.

Now Mr. Akbar Ali Moinfar, the Minister in charge of the Plan and Budget Organisation, has decided it is no longer necessary.

On a smaller scale, one of the world's largest sugar mills, built by the Dutch near Dezful in the

south-west, stands, rusting and unused several months after its completion. On oil products line to Mashhad in the north-east completed last year by INYEB, a joint Italian-Iranian venture, has still to be formally commissioned by NIOC.

A \$265m desalination plant at Bushire, being constructed by the Japanese, is one-third complete, but it will be a white elephant if the nearby West German nuclear plants, intended to provide its power, are scrapped, as seems likely.

This last example—projects that become meaningless if a decision to axe them is taken in isolation—is one reflected elsewhere in the Iranian industrial scene, especially in petrochemicals.

The massive Du Pont synthetic fibre plant at Isfahan is never likely to be economic without the domestic feedstock now highly unlikely to be produced in the next decade. In the overall confusion a new element to appear is inter-administration conflict over whether or not to proceed with highly expensive projects contracted under the Shah.

Unusually, it is the technocrats of the specialist agencies, such as the Atomic Energy Organisation of Iran, and the National Iranian Gas Company, who are the most adamant about cutting their losses.

The new head of the AEOI, Mr. Faridun Sahabi, a young engineer close to the Prime Minister and a zealous social reformer, is insisting on the cancellation of the two Kraftwerk Union nuclear plants at Bushire, despite the outlay to date of \$3.14bn and the fact that they are three quarters complete. Opposition to this stance comes from the Finance Ministry and the plan and budget organisation.

At NIGC, its chairman, Dr. Ali Morshed, is taking an even stronger stand against his organisation's former prize project, the \$3bn large diameter gas pipeline running from the southern fields to the Soviet Union.

Known as IGAT-2, much of the initial ordering of materials and laying of pipe has already been done. But in this case, as with the \$1.3bn Kalings LNG scheme, changes in world economics now make them much more dubious economic

prospects than when they were begun.

Much more insidious than the straightforward axing of major projects is the slow death many of them are being subjected to by factors directly related to Iran's post-revolution condition.

These are:

- Indecision and prevarication by a provisional Government unsure whether it will last more than a few months and afraid to take any controversial decisions;
- Disputes over back progress payments stretching, in some cases, into hundreds of millions of dollars and going back over a year;
- The strict curbing of the number of foreigners allowed to work in Iran in future; and,
- Worker committees maintaining a stranglehold over their old operations, in league with the local security committees.

Many cases of foreign management being held hostage on their sites or within the country until they meet the exorbitant claims being put in by the workers are being reported. It is a problem the Government says it deplores but has been helpless to stop.

On the other hand, grass roots power, as expressed by worker committees within the Labour Ministry and the Government Foreign Residents Bureau, is being exercised, making it even more difficult to finish off those projects given priority by the authorities.

## Insecurity

With all hope of handsome profits having disappeared, the financial dilemma for many Western companies is whether to hang on to their original contracts and keep a low profile, in the hope of recovering their debts from the clients, usually the Government; or whether to cut their losses and pull out. To stay on usually means having to carry a large idle work force as the Government has shifted its unemployment burden onto employers by insisting that the workers be kept on or given large back wage payments.

Indeed, at a time when there is little security in the land and power is in the hands of bands of discontents, unemployed workers, further agitated by the Government's blaming of

foreigners for the country's problems, many corporate headquarters are having to make the difficult decision of whether or not their men should venture into the Iranian countryside at all.

For many concerns, the last straw may be the Government's insistence that back payments will not be made until contractors agree to sign a document waiving all claims arising out of the revolutionary turmoil.

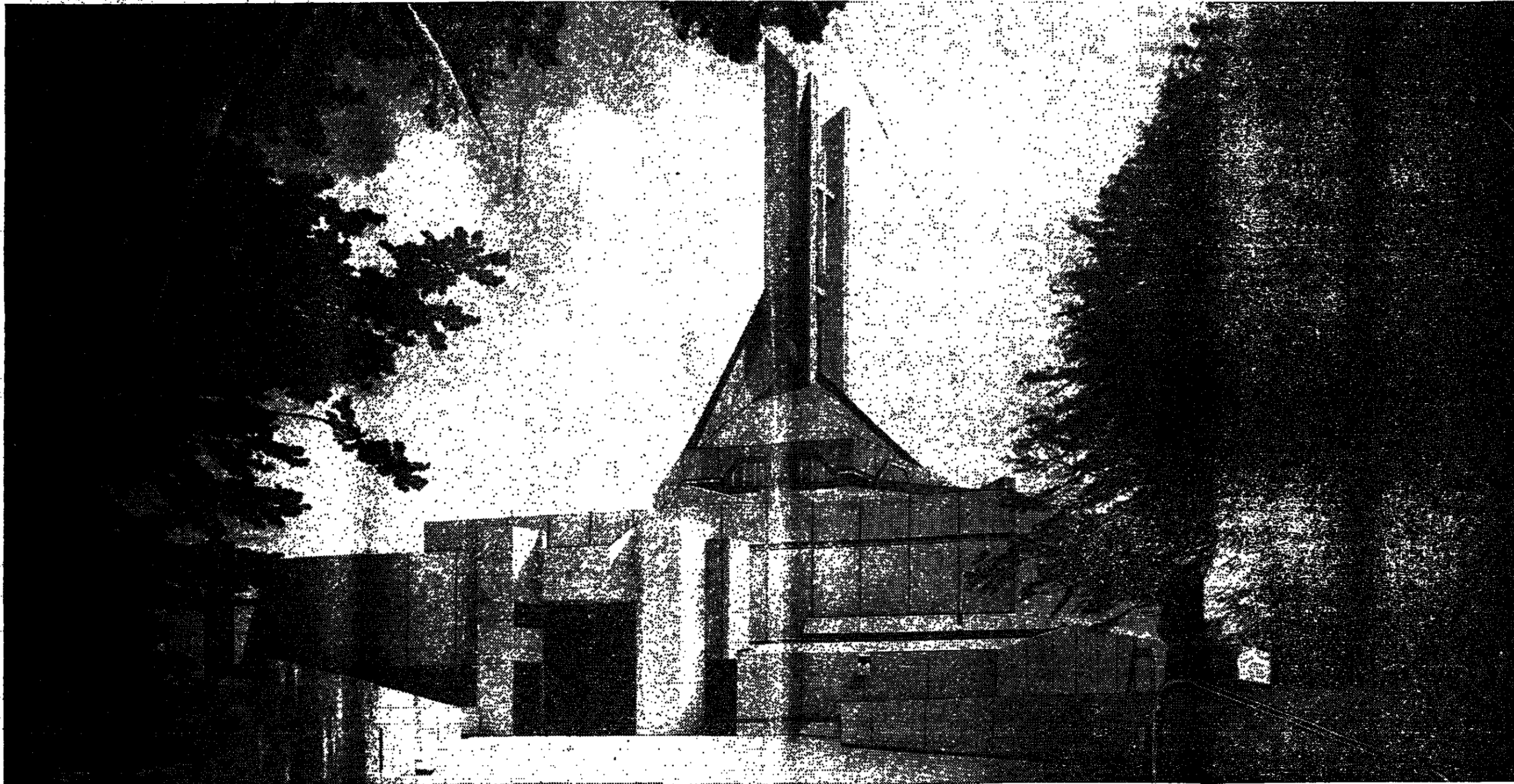
Unsurprisingly, the initial reaction of contractors has been an outright refusal to sign. Sumitomo and Furukawa, the Japanese companies building high tension power lines across the Alborz mountains to Tehran, are known to have refused point-blank.

Most Western companies, like the Iranian Government itself, will probably elect to defer any decision until the political fog clears.

On present indications, though, that day may still be a long time away, perhaps a year or more. By that time, even fewer of the unfinished projects will, no doubt, be deemed necessary and the graveyards will be fuller.

## SELECTED LIST OF MAJOR DEVELOPMENTS PROJECTS IN IRAN

PROJECT	PRESENT STATUS	COUNTRY	VALUE \$bn	CONTRACTOR
1) 2 x 1,200 MW nuclear power stations, Bushire	77 per cent complete, suspended, cancellation possible	West Germany	6.9	Kraftwerkunion
2) Gas secondary recovery/reinjection programme, Khuzestan	First phase completed. Low priority now, unlikely to resume	U.S./Britain	6.0	Ralph Parsons, Foster-Wheeler, Fluor
3) 2 x 900 MW nuclear power plants, Karun river	Site work completed. Cancellation certain	France	5.9	Framatome-led consortium
4) Iran-Japan petrochemical complex, Bandar Shahpour	85 per cent completed. Top priority, likely completion	Japan	3.3	Mitsui-led consortium
5) IGAT-2 Gas trunkline to Soviet Union	Third completed. Suspended. Almost certain cancellation	USSR/France/Britain/Poland	3.0	Wilmeg, Spie Batignolles, others
6) Tehran-Khorramshahr, Bandar Shahpour rail electrification	Low priority, unlikely go-ahead in near future	France/Denmark	3.0	Spie Batignolles, Kampsax
7) 1.5m tons pa steel mill, Bandar Abbas	Cancellation in balance, contradictory reports	Italy	2.9	Finsider/IRI
8) Tehran city centre development, Shahestan Pahlavi	Already cancelled as whole project	Britain	2.6	Llewellyn-Weeks-Davies
9) 1,150 mile highway, Qom-Bandar Shahpour	Preliminary work halted. No decision to resume	U.S./France	2.4	Morrison-Knudsen/Jean Lefevre
10) Sar Cheshmeh copper mines and plant, Kerman	Mine and initial process plant 90% complete. Work suspended	U.S./West Germany/Belgium	1.6	Anasconda/Parsons-Jurden/Krupp-Mechim
11) Kerman-Bandar Abbas railway line	Priority. Construction tenders may be invited again	Denmark	1.5	Kampsax
12) Electrification and doubling 400 mile railway, Tehran-Tabriz	Suspended. Go-ahead highly unlikely	Britain	1.4	Transmark
13) Tehran Metro	Construction first stage halted. Almost certain cancellation	France	1.3	Ratp/Sofretu
14) 1.2m ton pa steel mill, Isfahan	Cancelled after award few construction contracts	Britain/West Germany	1.1	British Steel Corporation
15) New port of Bandar Abbas	Awaiting backpayment \$177m and work permits. Hopeful	Italy	1.1	Condotte d'Acqua
16) New Tehran airport	Work stopped last autumn after site clearing. Cancelled	U.S.	1.1	TAMS
17) Kalings LNG project	Almost certain cancellation. Too many problems	France	1.0	Kalings consortium
18) Expansion overall telecommunications network	Dropped as whole project. ABI unlikely to return	U.S.	1.0	American Bell International
19) 200,000 b/d oil refinery, Isfahan	95 per cent complete. Last minute problems, Iran uninterested	U.S./West Germany	0.9	Fluor/Thyssen
20) Aromatics plant, Abadan	Construction contracts most unlikely to be awarded	Britain	0.8	Foster-Wheeler
21) Installation telephone exchanges and lines	Third completed. Extensive renegotiations underway	U.S.	0.8	GTE of Chicago
22) 1,740 MW thermal power station, Neka	Priority. First unit on stream summer 1979	USSR	0.7	Soviet Ministry of Energetics and Electrification
23) 2.5m tons pa sponge iron plant, Ahwaz	Russians asked to speed up work	West Germany	0.7	Brown Boveri/Deutsche Babcock
24) 1,240 MW thermal power station, Ahwaz	75 per cent completed. Work stopped but likely to resume	U.S./Britain	0.5	Easter/Swindell-Dressler/Foster-Wheeler
25) Shipbuilding/dry docks complex, Bandar Abbas	Drydocks — pessimism: shipbuilding — some hopes	South Korea/West Germany/Spain	0.5	Hyundai/Blohm and Voss/Dragados



Clifton Cathedral, Bristol. Architects: Percy Thomas Partnership.

## Who built the economy Cathedral?

Cathedrals and shoestring budgets seldom go happily together. Building to man's immortal spirit is no time to cut corners.

However, the Roman Catholic Diocese of Clifton, Bristol, did not possess limitless funds. All they had was an unpromising site in a Victorian residential area. What the Diocese achieved was a building of rare beauty, with a noble hexagonal nave seating 1,000, eminently suitable for all

liturgical functions, a 'fleche' soaring 165 feet to the heavens, and even an unobtrusive car park for 100 cars.

The material was concrete—a medium not normally associated with great architecture dedicated to the glory of God. The cost was well below a million pounds—an amazingly low sum for a building which will be an inspiration throughout its 1,000-year life span.

The builders were John Laing, not for the first time showing their adaptability and the understanding of an architect's problems which have helped make them one of the biggest construction companies in the world.

Clifton Cathedral won the Concrete Society Award. The judges commented: "The high standard of workmanship makes the detailing of the structure a pleasure to see at close quarters."

It is a building where design and execution have gone hand in hand to create architecture."

It was also a building where Laing had the satisfaction of helping make a beautiful idea take shape.

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# Liberal optimism in Liverpool

BY JOHN HUNT, PARLIAMENTARY CORRESPONDENT

IN THEIR manifesto for the European elections the Liberals confidently predict that they will win more British votes than in the recent General Election. Certainly, they will need to do so in order to win Liverpool, a city which is high on the list of target areas where they believe there is a chance of victory.

The Liberals base their optimism on the much publicised success which the party has achieved in the local elections for the Liverpool City Council over the years. Although they have not had an overall majority on the council they have controlled it over four years during the 1970s. On top of this came the surprising Liberal by-election victory by David Alton in the local constituency of Edge Hill earlier this year.

In this area of high unemployment and urban blight the Liberals have built up a formidable body of support by exploiting local grievances. They believe that this method can win the European seat for the Liberals next week.

A cool look at the statistics, however, shows the magnitude of the task. Eight of the city's constituencies, with the addition of Bootle, have been merged into one for the European vote. Of these, Labour holds six and the Tories two. The Liberals retained Edge Hill in the general election but their majority was halved. The Labour general election vote throughout the Euro-constituency was 184,000, the Conservatives 112,000 and the Liberals 45,000.

The Liberal candidate, Paul Clark, a local solicitor, believes that this pattern will not be repeated in the Euro-poll. He maintains that in the General Election the odds were weighted against his party by the "presidential" nature of the campaign and by the voters' knowledge that the Liberals could not form a government.

Needless to say the other candidates, Gloria Hooper, Conservative, and Terry Harrison, Labour, will have none of this.

Mr. Harrison, a self-proclaimed Marxist who sits on the Board of the Left-wing paper, The Militant, has no doubt that the Tories are his main enemy. His election slogan has a simple brutality — "Fight the bosses' EEC." His opponents are eager to highlight his Marxist beliefs but he dismisses their taunts as "the last resort of political cowards." Nevertheless, he is quick to disclaim responsibility for the bust of Lenin and the pennants from the East German Republic which decorate the offices of the trades council where he meets the Press.

He exudes a socialist puritanism and quivers with indignation as he describes a trip to Luxembourg to meet other European Socialists. "I never saw such luxury — 26 quid a night bed and breakfast."

Over at the Tory committee rooms the organisation seems to be running smoothly despite the recent plethora of elections. Miss Hooper, a lawyer with international experience,

is placing great emphasis on the amount of aid which Merseyside, an assisted area, has received from the European Regional Fund.

With the decline of the Atlantic passenger service into the port of Liverpool the city has looked with envy at the growing prosperity of the southern and eastern ports which has resulted in the growth of trade with the EEC. To counter this Miss Hooper emphasises that the development of the Community will bring increased wealth to all parts of the UK, including the North West.

Canvassing at an old people's home earlier this week there was a polite response until one military-looking gentleman announced that he had voted in the referendum against British membership of the EEC. This seemed to be the signal for a remarkably bitter outbreak of anti-European sentiment.

"The French are twisters . . .



# Holidays record predicted by poll

BY ARTHUR SANDLES

MORE BRITONS than ever intend having a holiday this year, and so many people plan to go abroad that foreign travel could top pre-recession levels, which could have ominous implications for the UK's until-now profitable tourism account.

This year's holiday intentions survey, done for the English Tourist Board by NOP Market Research, shows that 67 per cent of the British plan to holiday somewhere this year. This compares with 59 per cent who expressed the same intention 12 months ago.

This is good news for both home tourism and the UK's foreign markets, but the survey indicates that travel abroad is likely to rise faster than domestic trips.

British travel within the UK has remained a constant 40 per cent of a fluctuating market for the past five years. England's individual share this year, however, looks like going up from 27 per cent to 28 per cent of the total.

Travel abroad will probably increase from 15 per cent of the population to 19 per cent. Among higher income managerial groups 81 per cent plan a holiday of some sort, a third of the total intending to go abroad.

A striking feature of the survey results is the high intention of taking long holidays. Pollsters suggest that "the main holiday season in Britain will be about as prosperous as in 1978."

# Laker starts battle to end restrictions on Skytrain services

BY MICHAEL DONNE, AEROSPACE CORRESPONDENT

LAKER AIRWAYS starts a major battle this week, to try to get all restrictions on its low-fare Skytrain services to New York and Los Angeles removed.

The airline, whose services from Gatwick hitherto have been confined to a no-reservations basis, is asking the Civil Aviation Authority to allow it to accept forward bookings to carry cargo, and to offer several varieties of cheap fares instead of the one fare (£59 single to New York) permitted.

The proposals, if approved, would convert the Skytrain into a normal scheduled-type service, but at cheaper fares, offering severe competition to British Airways and to British Caledonian.

Both airlines are objecting to the Laker plan, and it is expected that this week's hearing by the Civil Aviation Authority, starting on Wednesday, will continue into Thursday.

Many major airport authorities world-wide meet at the Cafe Royal in London tomorrow, at the sixth World Airports Conference, to discuss the problems posed by the expected expansion of traffic through the 1980s.

The first production version of the Anglo-West German-Italian Tornado multi-role combat aircraft, will be rolled out of British Aerospace's Warton, Lancashire factory tomorrow, in the presence of Mr. Francis Pym, the Defence Secretary. The three countries will build 809 of these aircraft through the 1980s.

The Government has authorised a further payment on account of £1,050m in respect of compensation for Scottish aviation. This brings the total payment on account made in respect of this company to £2.1m.

A £10m radar system went into operation on Friday at RAF Saxa Ford, the early warning station in the Shetland Islands. The search and height-finding radar, installed by Marconi Radar Systems and Plessey Radar, will make a significant contribution to improved air defence for the UK and NATO.

# Luxembourg's national election could influence Europe

BY GILES MERRITT, RECENTLY IN LUXEMBOURG

THE OUTWARD signs of electioneering in Luxembourg are small and tidy. Neat little billboards about 4ft square have been erected — not too conspicuously — around the Grand Duchy and candidates' posters are arranged on them in what looks like a finely calculated share-out of space. Posters are not defaced, and it seems they are never obliterated by a rival sticker.

Yet underneath this decorum Luxembourg is in the throes of two election campaigns. On Sunday, June 10, Luxembourg will vote in both a general election and the Parliamentary Euro-election. Both polls have important implications for the country and are closely intertwined.

Luxembourg is physically and figuratively the epicentre of the Common Market. It is host to the secretariat of the European Parliament, and the majority of the Assembly's sittings have been here. The completion of the 404 Euro-MPs to be elected in the other member states is perhaps more important than the six seats to be filled by Luxembourg. But the outcome of Luxembourg's national election could influence the future of the European Parliament.

It sounds paradoxical, but the explanation is simple enough. M. Gaston Thorn, the Luxembourg Prime Minister, faces the possibility of losing office in the general election. If he is defeated he has indicated that

he would accept the post of president of the directly-elected European Parliament, in which position he could become the formidable champion of a more powerful assembly.

How the two elections will turn out, however, is far from certain. Democracy in the Grand Duchy operates on the same cumbersome system as Belgium. Taking the effects of proportional representation to their logical extreme, Luxembourgers now bemoan the fact that they cannot be sure their votes will not have the opposite effect to that intended.

The absurdity of the situation is exaggerated, but the fact remains that Luxembourg elections are increasingly inscrutable. The result of the 1974

general election that unseated the dominant Social Christian Party after 50 years of uninterrupted power confounded all the pundits. By much the same token, M. Thorn, himself the Liberal leader of a Socialist-Liberal coalition, hopes that the widespread expectation of a coalition defeat will be wrong.

His Government's view is that Luxembourg has no reason to replace an Administration that during its five-year term has successfully ridden out an international recession. Inflation and unemployment are low, at 3.7 per cent and less than 1 per cent respectively, and last year motor car registrations in the country hit new records. The issue, say Ministers, is not prosperity but whether or not

Luxembourg should be ruled by a single, self-perpetuating Party machine. They charge that the Social Christians, with their large budgets and their control of Luxembourg's most powerful newspaper, are concerned that the voters should not develop a taste for a two (or more) party system.

One suggestion is that the former Prime Minister, Social Christian M. Pierre Werner, miscalculated when in 1974 he invited M. Thorn to attempt to form a coalition. He did not believe, a Socialist-Liberal alliance was possible, let alone durable.

It is not a mistake he is likely to make again if an anti-coalition "landslide" of two or three seats takes place.

# Tories told of industrial needs

By Michael Cassell

THE GOVERNMENT will fail to revitalise Britain's economic and industrial performance unless sufficient resources are used to maintain and improve the basic services on which manufacturing industry depends, according to the Federation of Civil Engineering Contractors.

In a paper sent to Sir Geoffrey Howe, Chancellor of the Exchequer, and Mr. Michael Heseltine, Secretary for the Environment, the federation warns that unless the infrastructure needs of the economy are accorded proper weight in the public expenditure balance, policies aimed at restoring the vitality of the private sector will be thwarted.

The federation, with other representatives bodies from the construction sector have, since the General Election, been urging the Government to withstand the temptation to use the industry as an easy target for expenditure cuts.

They have pointed out the effects on construction of a long series of debilitating expenditure reductions and emphasised that its longer-term strength and capability would be irreversibly undermined if further cuts in workload were made.

But in spite of its efforts, the industry expects to be hit in the Budget, being warned by Mr. Heseltine that his department will have to bear its share of the all-round spending cuts being sought. Housing programmes in particular are expected to be affected.

Mr. Ian Robey, president of the Builders' Merchants Federation, said at the weekend that urgent action was required to tackle the deterioration of the existing housing stock. He told the Federation's annual conference in Crete that the revision of the renovation grant scheme was a top priority and called for action to encourage higher levels of new housebuilding.

# DC-10 operators not to sue manufacturer

BY IAN HARGREAVES

LAKER AIRWAYS and British Caledonian could eventually seek compensation for financial losses caused by the grounding of suspect DC-10 aircraft, but neither company intends to sue McDonnell Douglas, which manufactures the jet.

Both companies yesterday strongly denied reports of possible legal suits and said it was too early even to assess the scale of losses caused by extra safety checks on their DC-10s.

Laker said it might seek compensation through insurance channels once the inquiry into the crash 10 days ago of an American Airlines DC-10 at Chicago was complete.

According to Laker, however, passenger anxiety following the accident has made no impact on Skytrain's transatlantic business. "Loadings are good, although we get the odd person inquiring about the accident," the airline said.

British Caledonian said that preliminary returns for last week showed a dip in traffic, but the indications were that by the end of the week business had started to climb back towards normal loadings.

Meanwhile Varig, the Brazilian airline, has signed a \$270m contract for five more DC-10s. It already operates four similar aircraft. This is the first DC-10 order to be announced since the accident in Chicago.

Feature Page 15

# Lloyd's committee studies brokerage

BY JOHN MOORE

AN EMERGENCY inquiry has been launched by the Committee of Lloyd's of London into the affairs of a subsidiary of Christopher Moran Group, an insurance brokerage.

The move follows an approach to the 18-strong Lloyd's committee by auditors of a medium-sized underwriting syndicate.

The auditors told the Lloyd's committee that they were unhappy that Christopher Moran and Company had not complied with the terms of a binding authority. A binding authority is an authorisation to accept business on behalf of the Group's Lloyd's subsidiary syndicate up to certain agreed limits.

The auditors are concerned that discounts and profits commissions may not be in accordance with the terms of that authority.

The binding authority allowed Christopher Moran and Co. to accept aviation reinsurance business up to certain limits.

The inquiry team is headed

# Local authorities step up use of leasing

BY MICHAEL LAFFERTY

LOCAL AUTHORITIES are setting ground Central Government restrictions on capital expenditure through increased use of leasing. Lease payments are classified under revenue expenditure, which is subject to less stringent cash limits.

The much increased use of leasing is admitted by local authority representatives and City-based lease broking firms. However, the full extent to which the authorities are acquiring capital items, such as equipment and refuse vehicles this way is not known.

Mr. Ian Courts, chairman of the finance committee of the Association of County Councils, suggests a maximum scale so far of £400m for England and Wales. This would amount to about an additional 10 per cent of capital expenditure by the authorities this year.

Mr. Peter Jasilkowski, head of R. P. Martin Leasing, one of the leading lease brokers in the local authority area, believes the maximum figure is closer to £250m a year.

The official Treasury attitude is that the Government frowns on the practice, though no action is contemplated while the scale is thought to be fairly limited.

Leasing also allows local government to benefit from tax allowances given to the corporate sector, which in theory could reduce the cost of capital equipment leased by as much as half.

However, in practice the tax saving is shared between the industrial company providing

# Fewer dry cargo ships laid up

By Ian Hargreaves, Shipping Correspondent

THE VOLUME of UK dry cargo shipping idle last month fell to its lowest level for four years.

Seasonal and cyclical factors are combining to draw an increasing number of dry cargo ships out of lay-up according to figures published today by the General Council of British Shipping.

The world total of idle dry cargo ships has also been falling steadily in the past year, with 371 ships totalling 5.4m deadweight tons idle at the end of April, compared with 14.3m dwt a year ago.

This means that 2 per cent of the world dry cargo fleet is idle.

In the UK fleet, only 15 dry cargo ships remain idle, representing 1 per cent of the total, although this trend has been assisted by heavy sales of dry cargo ships to foreign flags.

# Survival appeal raises £50,000

A PUBLIC appeal launched three weeks ago has raised £50,000 for the Rare Breeds Survival Trust.

Mr. Denis Vernon, the trust secretary, of Appleby Castle, said members hoped to raise £100,000 for promoting and building up trust collections throughout Britain.

# 1978 Another successful year for WestLB.



**Facts 1978**  
WestLB's figures for the business year ending December 31, 1978, are proof of continuous achievement:  
Consolidated Balance Sheet: DM 93.3 billion  
Earnings after Taxes: DM 152.0 million  
Total Capital Funds: DM 2.14 billion  
Total Group Business Volume: DM 128.2 billion

As a result of its particular strength in the German domestic capital market WestLB played a major role in providing long-term fixed-interest DM loans to foreign borrowers.

**Growth in Domestic Lending**  
Lending on the domestic markets rose by 10% to DM 74.5 billion. There was expanding demand for long-term fixed-interest funds. This growth was due to increased corporate lending as well as export and leasing financings. Substantial growth in building financings and also in state and municipal loans further fortified WestLB's traditionally strong position in the domestic market.

Funding increased in line with lending expansion. The volume of WestLB bonds in circulation rose by 16% to DM 33.7 billion, thus broadening WestLB's main funding base. Client deposits advanced 6% to DM 20.9 billion while bank deposits grew 12% to DM 25.6 billion, including US \$ 714 million in certificates of deposit.

First quarter results in 1979 are commensurate with WestLB's leading position in international finance.

A strong force in wholesale banking

# WestLB

Westdeutsche Landesbank

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*Johnnie*



Reinsurance brokers blamed for friction

By John Moore

REINSURANCE BROKERS have caused friction between themselves and London underwriters according to the Mercantile and General Insurance Company, the UK's largest reinsurance group.

The broker often keeps the funds remitted to him by the insured concerned that is to be insured "for an undue length of time before passing them to the reinsurer in order to gain or himself the interest to be earned" on the funds held.

Domestic demand 'set to fall after summer'

BY DAVID FREUD

THE PRESENT recovery in domestic demand will not be sustained beyond the summer, according to de Zoete and Bevan, the City stockbrokers.

trend over the coming recessionary year, de Zoete says, reflecting one of the more vivid aspects of "Dutch" disease.

Fiesta in short supply in UK

By Kenneth Gooding, Motor Industry Correspondent

PRODUCTION difficulties in Spain and the UK coupled with continued high demand have left the British market very short of Ford's small car, the Fiesta.

High price of dispute at BSC'S £100m terminal

BY ROY HODSON

THE INTER-UNION dispute preventing iron ore deliveries to the British Steel Corporation's new £100m deep water terminal at Hunterston on the Clyde was described yesterday by Mr. J. G. Stewart, managing director of the corporation's Scottish division as the sort of thing we can't afford in Scotland.

between union officials is to be held in Glasgow within a few days. The argument is over approximately 100 new jobs to man the terminal on a shift basis.

ore terminals at Teesside, and Port Talbot, South Wales. British Steel is expected to take a policy decision soon on whether or not to put the DR ore plants at Hunterston into production.

Lines link to cut Gulf tonnage

BY IAN HARGREAVES, SHIPPING CORRESPONDENT

PENINSULAR AND Oriental Steam Navigation Company has, with five other prominent shipping lines, acted to reduce costs and consolidate tariffs in key services between Europe, UK and the Middle East.

caused by the revolution in Iran, which was responsible for a quarter of P & O's liner business.

Checklists aid to sales BY LISA WOOD THE British Institute of Management has published two management checklists to help members recognise their competitors and customers.

Entitled Know Your Customers and Know Your Competitors, the checklists suggest several basic questions which need to be answered by those responsible for marketing and selling.

Accountants fear poor turnout

BY MICHAEL LAFFERTY

LEADING accountants are worried that a poor turnout at the profession's first public hearings on accounting standards could be damaging to the profession.

of its intention to attend. It is also expected that Arthur Andersen, Peat Marwick Mitchell, Touche Ross, Thomson McLintock, and Arthur Young McLelland Moores will be speaking. But major firms which will not be taking advantage of the opportunity to put their views — and be cross-examined in public — include Coopers and Lybrand, Price Waterhouse, and the newly named Ernst and Whinney (which includes Whinney Murray and Turquand Barton Mayhew).

One of the few individuals who has given notice to speak is Professor Edward Stamp, from Lancaster University. His criticisms of accounting practices in the late 1960s led to the formation of the Accounting Standards Committee by the leading accounting bodies.

LOOKING FORWARD TO 1980 AND BEYOND:

Coloroll: Europe's Fastest Growing Wallcoverings Manufacturer

A COMPANY PROFILE



John Bray, Managing Director.

Teamwork: The Key

"Strong management through teamwork is the key," says John Bray, Managing Director of Coloroll. "I believe in getting the right team around me committed to it, and believing in, what they're doing."

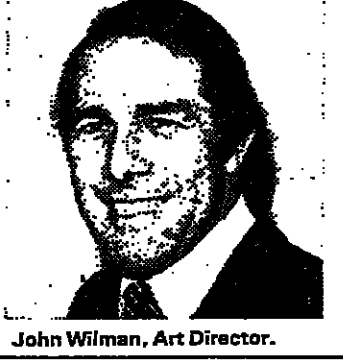
John Ashcroft, Deputy Managing Director.

Coloroll, the fastest growing manufacturer in the wallcoverings/D.I.Y. market in the U.K. and Europe, is proof that manufacturing can benefit from Britain's D.I.Y. boom that has provided such spectacular growth for the multiple retailers like Homecraft, B. & Q., A. G. Stanley and L.C.P.

The pattern of retailing was beginning to change in D.I.Y. and wallcoverings, just as it had in foodstuffs. The progress of the large multiple retail specialists like Homecraft, A. G. Stanley and Decorecca was beginning to gather momentum and in Coloroll the multiples found a source of well designed, low cost, high volume, 'own brand' collections.

£3/4m investment in this year's new designs

The Coloroll investment in the original design and development of new vinyl wallpaper ranges is in excess of £750,000. Responsibility for this work is that of John Wilman, probably the industry's top designer in his area, who joined Coloroll in 1977.



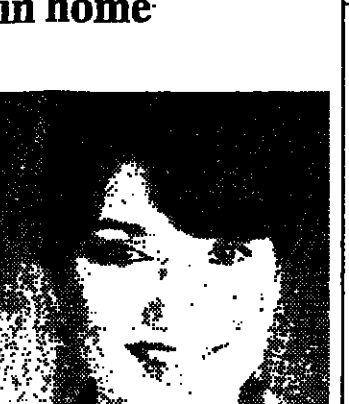
John Wilman, Art Director.

ing, if real sales volume is to be achieved," John Wilman explains. "What our customers are buying is design and ultimately it is good design that makes the sale. We place great importance on selecting the right design and colour combinations to make up the final Coloroll collections that we introduce to the market."

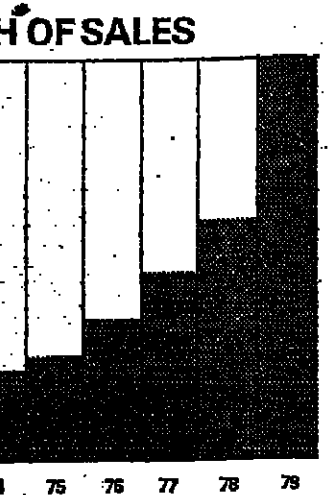


DOLLY MIXTURES by Linda Beard the sweetest thing in home decorating

In 1978, Coloroll launched its Dolly Mixtures collection of coordinated wallpapers and fabrics, designed by Linda Beard. This was an instant success and became accepted as the pace-maker in a new concept of home decoration, co-ordinating designs and colour, used in a myriad of household products such as bed covers, sheets and pillowcases, blinds and curtains, lampshades and kitchen textiles.



Linda Beard, who created the Dolly Mixtures collections for Coloroll.



Mr. Energy or Mr. Integrity? Bill Dobie, Coloroll's Sales Director, has 25 years experience in the industry. He joined the company late in 1977 because he believed in its tremendous potential.

Coloroll's modern, high speed flexo printers are stretched to the manufacture of wallcoverings, not however to produce large collections for passive distribution by the trade, but to concentrate on 'own brand' collections for marketing by major retailers.



Investment: The key to growth

Re-investment: High 'Growth' Low Gearing: is the formula for Coloroll's profit performance. Over the current 12 month period the company is installing four new Cobden Chadwick gravure machines together with embossing and shrink-wrapping equipment to increase capacity to meet the levels of sales growth. More than £1 million is being spent on this production machinery.



Peter Cartlow, Finance Director, structuring finances to the challenge of a high growth, high investment phase.

Glynn Thomas: Production Director, handling a demanding programme of machinery installation.

Keith Pickard: Buying Director, responsible for all materials and capital investment purchases.

Export Sales: An essential ingredient in a successful formula

In 1978/79, a major proportion of Coloroll production was devoted to export markets. Terry Robbins, Export Director, explains: "We sell into approximately 50 different markets, but the most valuable to us is the E.E.C. Exports were worth about £7.5 million in 1974, doubled in value by 1977 and doubled again last year to over £12 million. A similar level of growth is planned for the current year."

Coloroll Ltd., Riverside Mills, Nelson, Lancashire and at 54 Jermyn St., London SW1.

In addition, over £300,000 is to be spent on expanding warehouse facilities at two locations in Nelson, Lancashire and a further £100,000 is to be invested in a large I.B.M. 34 computer installed in the Coloroll sales office for the use of the telesales team, providing up to date information on stock and order situations.



Don Smith, Director of the Packaging Division.

More than wallcoverings in the Coloroll product mix

During the past 12 months, Coloroll has rationalised its product range drastically. The low profit, paper packaging and merchandise division has been dismantled to free the firm, and release the energies, of management for the development of the wallcoverings business.

One area of packaging that has been retained and into which further investment is to be made is plastic packaging and 'Supabag'. Coloroll's patent carrier sold to major retailers like Spar, Marks & Spencer, Boots and Sainsbury's. £250,000 is being spent on new machinery to double production capacity and sales volume in 1980.

Coloroll's Packaging Director, Don Smith, is responsible for the development of this division of the company which currently is forecasting sales of 150 million large bags a year.

Coloroll - in business for the '80s



# UK NEWS—LABOUR

## Post Office engineers to press 25% claim

By Our Labour Staff

POST OFFICE engineers yesterday threatened to take industrial action from July 1 if their claim for pay increases of 25 per cent is not met.

Action by members of the Post Office Engineering Union could block out television programmes and delay telephone repairs and installations. The action would include an overtime ban and selective strikes.

Mr. Bryan Stanley, general secretary, told the union's annual conference at Blackpool: "We must make it clear that we are not going to be pushed on one side by the Post Office board, by the Government or by anybody else."

The union has rejected a pay offer of 9 per cent with further rises of 3½-7 per cent for grade restructuring. Two unions representing clerical and computer workers have also rejected the offer, and their selective strikes have halted the issue of all computer-processed telephone bills and held up payment of £350m.

### Food workers

Mr. Terry O'Neill, national president of the Bakers, Food and Allied Workers' Union, opened the union's annual conference yesterday with a stinging attack on former Ministers and union leaders.

Mr. O'Neill, who is also acting general secretary following the sudden death in April of Mr. Sam Maddox, said in Margate that recent years had seen Labour ministers and union leaders "winning, dining and living to a very high standard" while expecting many workers to accept meekly small increases on already small incomes.

Mr. O'Neill attacked the decision by Lord Scaillon, formerly president of the Amalgamated Union of Engineering Workers, to take a life peerage.

Mr. Sid Weighell, general secretary of the National Union of Railwaymen, told NUR branch secretaries in Southampton yesterday that in the Conservative Government the country faced an administration hostile to the nationalised industries. The "menace" of lower Government spending on support for the railway passenger business and on the industry's capital investment programme was "crystal clear."

## Chemical industry pay offer heads for rejection

By Philip Bassett, Labour Staff

CHEMICAL PROCESS workers are believed to have rejected a pay offer that would cut the working week in companies introducing new technology.

Union leaders regarded as a breakthrough an agreement by the Chemical Industries Association, which has 350 member companies, to allow individual companies to negotiate a cut in hours.

The results of consultation with union members on the offer, which covers about 60,000 process workers, are expected at the end of this week.

Reports from the regions to union head offices, however, indicate that the agreement which would add about 1½ per cent to the industry's wage bill, has been rejected. The offer was circulated with no recommendation from union negotiators.

The move to cut the working week seems to have been welcomed. The Transport and General Workers' Union, one of three involved, says that six companies have offered to agree locally to reduce hours.

The disagreement is thought to arise from the amount of new money offered: a 12½p an hour increase on basic rates and the transfer of 8p to those rates from locally negotiated pay increments.

Shift allowances would be increased by 42 per cent, call-out payments by 50 per cent and drivers' subsistence allowances by 25 per cent.

Details of a pay offer to 52,000 Imperial Chemical Industries' manual workers are being sent to union members for discussion after talks last week.

Union negotiators rejected an offer worth about 15 per cent last month. The improved offer is estimated to be worth about 18½ per cent. ICI says it is final.

The new offer contains improvements to differentials for the company's eight-grade structure, and is being sent without a recommendation. Results are expected by June 18.

Pilkington shop stewards will meet national union officials at the glass company's St. Helens plant today after union negotiators last week rejected a pay offer of about 9 per cent on basic rates.

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## Tougher NALGO strike policy

By Our Labour Staff

BRITAIN'S largest white-collar union, the National and Local Government Officers' Association, is likely to toughen its strike policy after last winter's prolonged industrial action by social workers.

Though the 730,000-strong union has already decided to make substantial cuts in the level of its official strike pay after losing about £21m in the social workers' dispute, a motion to be considered at its annual conference next week calls for a re-examination of strike policy to make action more effective.

The motion, signed by eight branches, will receive the support of the union's executive. It calls for a paper to be prepared on industrial disputes procedures and suggests that

conditions on the payment of strike pay should be introduced to ensure that strikers participate fully in any action, such as picketing.

It also calls for consideration of the introduction of a levy during a dispute to keep the union's strike fund "at a level high enough to allow disputes to continue until successfully concluded."

The union's strike fund stands at about £300,000 after the social workers' dispute, probably the costliest industrial action in the union's history.

Branch feeling against the conduct of the dispute—action and its effects differed widely from region to region—is shown in motions calling for national organisation of militant action

and for joint pay claims for all union members from next year.

One branch has tabled similar motions to the water service, local government, gas, electricity, universities, health and new towns' group meetings at the conference, all instructing union negotiators to reject any pay offer which falls below 13 per cent.

The executive's motion on pay is opposed to overall pay policies, though it states that a new economic contract with the Government is essential, and it sets out an objective of securing settlements comparable with the general level. The union has backed a claim for a 15 per cent increase and a comparability study.

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## Barclays' staff agree seven-day working

By Our Labour Staff

BARCLAYS BANK computer staff have agreed by ballot to seven-day working. Voting was roughly 2-1 in favour.

The agreement on the Bank's proposals provides for not more than 35 hours a week to be worked, and not less than 33½ hours. The shift allowance to computer staff will be 45 per cent of salary, subject to minimum and

maximum annual payments of £1,131 and £2,868.

On the introduction of seven-day working, staff making the change who have at least one year's service will receive a special payment based on length of service, salary and age.

A computer worker aged 30, for example, with 10 years' service would under

the formula receive a payment of 25 weeks' basic salary.

The TUC-affiliated Engineers' and Managers' Association has reached agreement with the non-TUC Association of Management and Professional Staffs for mutual co-operation between the two unions.

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For the attention of Mr. Schusters, Technical

Dear Sir,

**Micro-wave Leakage Detector**

On 25th September last, you were kind enough to send me the technical page of the Financial Times on the micro-wave Leakage Detector manufactured by Victor Co. of Australia. We are pleased that one of the companies who produce an article has now taken to the world's largest company is

Micro-wave Monitoring & Services  
 28 Hill Lane,  
 London NW6 4HT

This company is now seeking regional and major P.F. coverage in newspapers, and magazines during the next few days.

Many thanks for the great assistance you are in locating this excellent outlet.

Yours sincerely,  
 George Dean

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To run the finances of a multi-market business like The Thomson Organisation, a man must be as multi-faceted as his company.

His banker must be the same.



W. Michael Brown, Finance Director, The Thomson Organisation

David A. Moring, Vice-President, Chemical Bank

As Finance Director of The Thomson Organisation, Michael Brown must manage the financial resources and help assure the profitability of a large and rapidly growing group with interests in publishing, travel and petroleum.

Thomson publishes The Times, The Sunday Times, regional newspapers, books, Family Circle in the UK, Living, numerous trade, technical and educational publications in some ten countries around the world, owns Thomson Travel and its subsidiary Britannia Airways. Through an association with the Occidental Consortium, it is involved in the development of oil fields in the North Sea.

So Michael Brown must have

in-depth financial knowledge not only about Thomson's products, but about the countries in which Thomson operates. His Chemical Banker, David Moring, must have the same.

"David's understanding of our business is important," says Brown. "But so are the flexibility and fast response he and his Chemical Bankers come up with."

Working closely with Michael Brown, David Moring and his team have provided TTO's publishing interests with multi-purpose, multi-duration credit facilities in six local currencies exactly when required. In a half-hour meeting, they thrashed out an agreement in principle on a medium-term loan for North Sea oil development.

Through Chemco International Leasing, a Chemical Bank subsidiary, they helped Thomson's Britannia Airways lease a Boeing 737-200 in minimum time.

Says Brown, "Chemical Bankers get things done because they don't have to go back to the head office for approval on every decision." Obviously, Michael Brown works with other international banks. But David Moring's personal understanding of The Thomson Organisation and the bank's flexibility are two important reasons their relationship continues to grow. That's what usually happens when financial executives get together with Chemical Bankers.

The difference in money is people. **CHEMICAL BANK**

Chemical Bank House, 180 Strand, London WC2R 1ET Tel: 379,7474 Representative Offices: Scottish Provident House, 1-2 Waterloo Street, Birmingham - Charlotte House, 17 Charlotte Square, Edinburgh - Mann Plaza, New York, N.Y. - Edinburgh, Frankfurt, Hong Kong, Houston - Jaffar, London, Madrid, Manila, Mexico City, Milan, Montevideo, Nassau, Paris, Rio de Janeiro, Rome, San Francisco, Sao Paulo, Singapore, Sydney, Tientsin, Tehran, Tokyo, Toronto, Vienna, Zurich.

*Jeff Maitland*



Joel, me, etc.

# The new Peugeot 305 diesel. Up to 53mpg.\*



Exceptional economy has now been added to the proven virtues of style, comfort and value for money of the Peugeot 305 range, with the launch of the new diesel 305 GRD.

While fuel economy is all important these days, the family car that can obtain over 50mpg is still very rare. The new Peugeot 305 GRD however, is such a car.

## Style,

The GRD is powered by a unique 1548cc all-aluminium alloy diesel engine. This further adds to the already exceptional fuel economy by not only saving weight but also by ensuring optimum heat dispersal. Mounted transversely it drives the front wheels and produces quiet, smooth power with a top speed of 84 mph.

## after mile,

If you average around 8,000 miles a year, we admit that there's little to choose between a petrol car or its diesel powered equivalent. Over and above this mileage however, the advantages of diesel take over and the more miles you drive a year the greater economic and social sense the 305 diesel makes.

The GRD not only benefits you economically but also the world environmentally. The use of diesel helps reduce the drain on our already limited energy resources but also ensures through its cleaner burning qualities, a reduction in the level of air polluting toxic emissions.

There's more to diesel though, than just good mpg. There's proven reliability and greater engine life expectancy. And you can expect excellent cold and damp starting characteristics due to the fact that a diesel engine doesn't need spark plugs, points or a coil.

## after mile.

The GRD retains all the hallmarks that have given the 305 range such widespread appeal. Beautifully styled body lines, an exceptional ride due to the four-wheel independent suspension and an extra long wheel base which means that you sit in between the wheels and not over them. There's rack and pinion steering for precise and predictable cornering plus front and rear crumple zones as well as many other in-built safety features for maximum passenger protection.

The equipment is of the highest standard with carpets throughout, 3-speed heater fan, heated rear window, clock, reversing lights and rear fog lamps to name but a few. There's even an optional sliding steel sunroof.

The Peugeot 305 GRD offers you exceptionally economical motoring without sacrifice to comfort and style. Why not test drive the GRD at any of our 250 dealers nationwide and prove its qualities for yourself.

*Fuel consumption (in accordance with official Government test procedures)		
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53.3 mpg (5.3l/100 km)	36.7 mpg (7.7l/100 km)	40.3 mpg (7.0l/100 km)

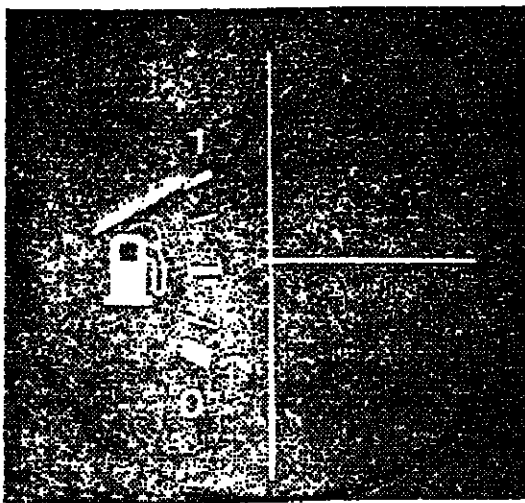
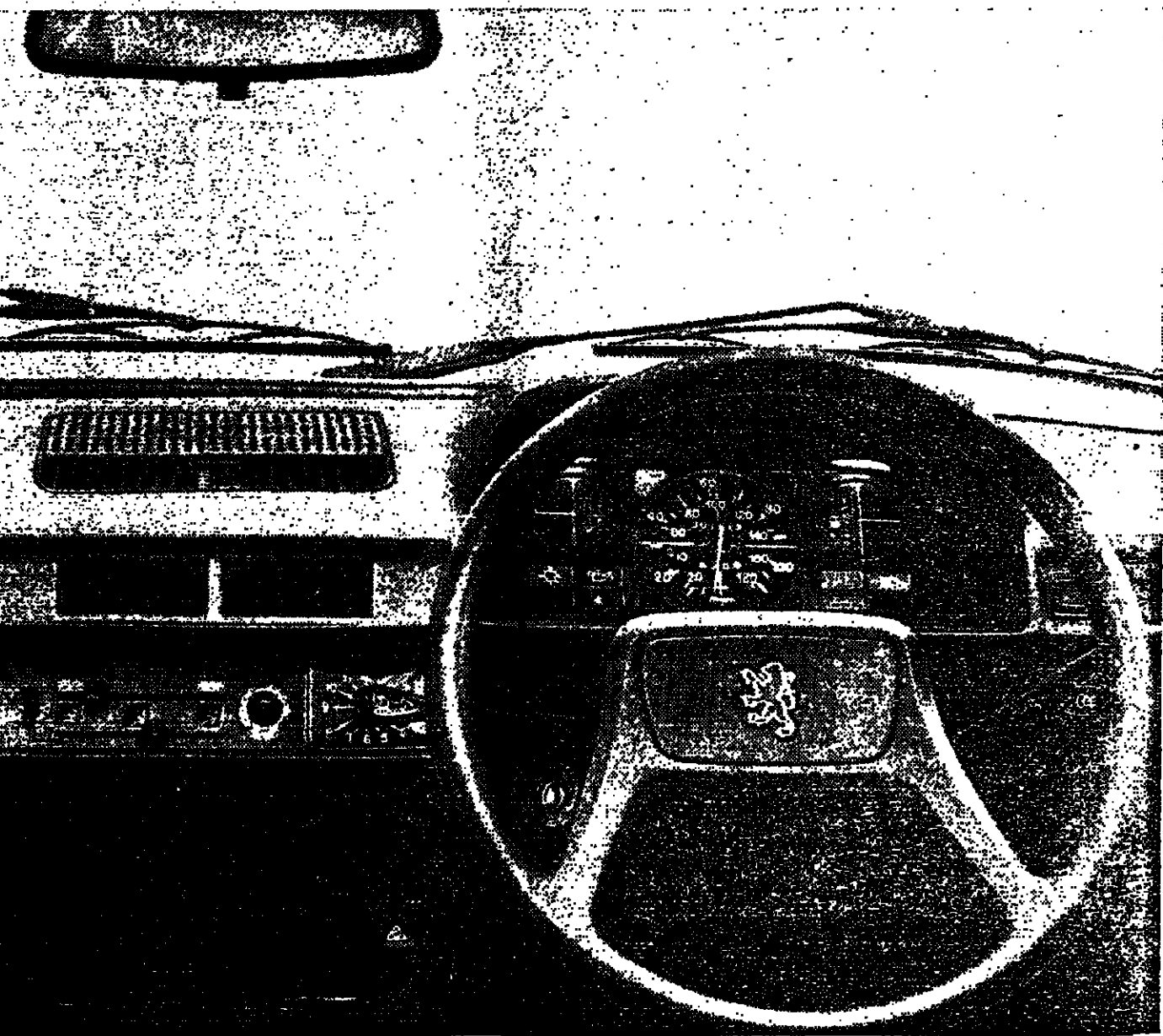
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# Building and Civil Engineering

## Improving the way to the oil wells

BOVIS INTERNATIONAL has been appointed technical consultant to the Gulf Oil Corporation, Egypt, for the up-grading of oil-well access roads in the Sinal desert.

Located near the East Bank of the Suez Canal and close to El Qantara, the existing roads extend over 15km and are of

black-top construction laid on low-lying land reclaimed in recent years from the Mediterranean. They also bridge reception lagoons created during widening operations on the Suez Canal.

Now they require to be provided with an effective drainage system and generally up-graded to take lorry loads of up to 50 tons so as to facilitate exploration

drilling in the area by Gulf Oil.

The construction work, which is located in a restricted, high security area, littered with war debris, has been started by an Egyptian contractor.

Another task for Bovis International is the provision of coordination and administration for the completion of the European Investment Bank's

new headquarters in Luxembourg.

Consultants already appointed for this project are: Denys Lasdun Redhouse and Sotley architects; Scott Wilson Kirkpatrick and Partners, consulting engineers; and Widnell and Trollope, quantity surveyors. The general contractor is Philipp Holzmann A.G. of Koblenz.

## Mowlem wins £8m road contract

AN £8m contract to build the Beverley by-pass, north of Hull, has been awarded by the Humberside County Council to John Mowlem. The company has also been awarded a £8.4m contract for the first phase of a £16m sewerage project at Grimsby, South Humberside.

The 6.25 mile long Beverley by-pass will be mainly single

carriageway except for a mile of dual carriageway at an interchange with the A164 Beverley to Anlaby road. It will run from Killingwoldgraves, west of Beverley to Ings Bridge, near Cottingham. Near motorway standard with limited access it will have 11 bridges including one over the Hull-to-Scarborough railway.

The sewerage contract, which has been awarded by the Lincoln sewage division of the Anglian Water Authority involves construction of over 21 miles of mainly 8.33 feet diameter tunnel constructed from pre-cast concrete segmental rings. These rings are to be lined with in-situ concrete to give a finished diameter of 71 feet.

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## Gas terminal work worth £5m

TWO CONTRACTS worth a total of more than £5m have gone to William Press and Son for work at Shell Expro's St. Fergus gas terminal.

In excess of £3m, first contract is for the erection of part of the piping and mechanical equipment on-site; second part is worth over £2m and comprises off-site piping and equipment erection.

Whole job calls for installation of 8-inch bore fine grain killed carbon steel, fully killed carbon and stainless steel piping, and associated mechanical equipment, including compressors, fired heaters, vessels, heat exchangers, valves and pumps.

The housing contract for West Lothian District Council involves the upgrading of 104 pre-war houses at West Calder. The tenants will remain in occupation throughout the operation and Cubitts, which has had considerable experience in refurbishing public sector housing, has

to phase the improvements to cause minimum disturbance to the occupants.

Architect for the scheme is the West Lothian District Council's Director of Architectural Services, G. A. Stenhouse; quantity surveyor is C. B. S. Fulton.

## Opencast work

SGR GROUP'S CSG mechanical plant division, Lomount Construction, has been awarded an opencast coal mining contract by the National Coal Board for the recovery of about 121,000 tonnes of coal at Rowley, County Durham.

Contract is worth more than £1m and work is now under way. Upon completion, the area will be restored to farmland within two years, says the company.

## Two awards to French Kier Work for Fairclough tops £6m

INCLUDED IN two contracts, together worth £2.4m, for French Kier Construction is a £1m project for the London Borough of Islington. This covers the erection of 69 dwellings and a community room at Athelstone Road, London N4. Work has begun and will take two years to complete.

Second contract, worth £1.2m, is for Alan Lynemouth of Northumberland and includes the extension of the existing ash lagoon and the relocation of existing ash slurry pipeline, modifications to existing overflow weirs, and all associated drainage and fencing works.

MOST IMPORTANT contracts, in a total of over £6m, awarded to Fairclough Construction, are a £1.4m "slide-in" bridge for British Rail at Brentwood, Essex, and a £1.3m bus station with office block and shop units in Stockport for the Greater Manchester Passenger Transport Executive.

Other work for British Rail includes lowering two rail

tracks on the main London to Bedford line at Kentish Town and electrification equipment, at about £320,000.

At Walton Summit Industrial Estate, near Bamber Bridge, the company is building four steel-framed factory units for the Central Lancashire Development Corporation in a bid to attract new industry to the area.

Under a £3m contract, for Shell Chemicals' Wythenshawe, Manchester, the company is

constructing extensions to service buildings.

Among the rest of the jobs making up the full total are: substructure for Royal Mutual at Colchester, concrete water tower, near Norwich, new water pipeline at Ipswich, underground reservoir in East Anglia aircraft test pads at Bentwaters and Woodbridge, Suffolk, building foundations at Newmarket, and a concrete reservoir near Colchester.

## Two Scottish jobs for Cubitts

CONTRACTS FOR factory extensions at Edinburgh and housing modernisation work at Bathgate together worth £1.7m have been awarded to Holland, Hannen & Cubitts (Scotland).

At the Scottish Development Agency's South Gyle Industrial Estate, Cubitts—member of the Tarmac Group—is to build a 11.2m four-storey extension to a block which the company is currently completing for Ferranti. Associated work includes a single storey store, a link corridor joining the new extension to existing buildings, and the provision of access roads and services.

The housing contract for West Lothian District Council involves the upgrading of 104 pre-war houses at West Calder. The tenants will remain in occupation throughout the operation and Cubitts, which has had considerable experience in refurbishing public sector housing, has

to phase the improvements to cause minimum disturbance to the occupants.

Architect for the scheme is the West Lothian District Council's Director of Architectural Services, G. A. Stenhouse; quantity surveyor is C. B. S. Fulton.

## Bryant wins £2m contracts

OF THREE contracts awarded to C. Bryant and Sons, two are together worth £1.2m in a total value of £2m. First one is to erect 52 two-storey houses and flats together with site development works in The Butts, Walsall. The other is for extension to Brownhills Comprehensive School in Deacon Avenue, Brownhills.

Final job is for the erection of 12 warehouse units and associated offices for Minworth Industrial Park on its site off Forge Lane, Birmingham. This work is worth £320,000.

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## Over £2.8m contracts won by Monk

WIDE VARIETY of work recently awarded to A. Monk and Co. totals about £2.8m. This company's patented system of suspended mobile work platforms will be in use at St. Pancras Station for the removal and replacement of roof sheeting to a train shed for British Rail, valued at over £700,000 while as part of the A19 Billingham diversion, the company will

construct a £591,000 under-bridge for BR at Billingham Bottoms, Cleveland.

British Gas Corporation has accepted a £107,588 contract for civil engineering work at Bishop Auckland and other jobs include bungalows for Bradford Council, workshop and offices for Welsh National Water Development Authority and advance factory units for the Welsh Development Agency.

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## IN BRIEF

- Taylor Woodrow will build a 2,300 sq metre factory extension at Hartlepool, Co. Durham, under a £279,000 contract awarded by Marbourn, part of Berec Group.
- Warwickshire Area Health Authority has placed an £80,000 order with S. Wernick and Sons of Brownhills, West Midlands, for the company's timber-framed building service for non-resident staff changing accommodation at Warwick Hospital.
- An aeromagnetic survey of an exploration concession in northern Thailand is to be carried out for Thai Shell Exploration and Production Co. by Hunting Geology and Geophysics.

## Housing at Enfield

MODERNISATION of 120 houses for the London Borough of Enfield will be undertaken by Corral Construction under a £1m contract.

Dwellings are on the Galliard Estate, Edmonton, N9, and work involves modernising the bathrooms and kitchens, installation of central heating, full redecoration, repairs and some energy conservation work to all properties.

Work is to be carried out while tenants are in occupation over a contract period of 78 weeks.

## Support for Sweden is offered

DESIGNED TO extend the capability of Haki Scaffolding's system of access scaffolding is a new range of components to be used in conjunction with the company's standard access equipment.

Several different methods of support with only three basic components are now possible.

Two basic modes are a fork-head system (BVA) used with existing timber or metal beams, and a drophed system (BVB) designed for use with special Haki primary and secondary beams.

The first is used where the contractor is using his own support beams or, with aluminium primary beams supplied by the company.

The second method is claimed

by the company to be the only support system available in the UK which incorporates its own interlocking aluminium primary and secondary support beams. These are strong and lightweight (35 per cent lighter than alternative) and slot easily together, conforming to the usual pattern of beams and joists in normal shoring. Wooden strips are set into the beams so that the deck forms can be fixed in position.

Manufactured in Sweden by Haki-Produkt AB, the system scaffolding is available in Britain through Haki Scaffolding (UK), North Anston Trading Estate, Houghton Road, Anston, Sheffield (050 978 5956).

## Distributor in Saudi

GKN MILLS Building Services has appointed Abcalaziz Al-Binali Trading and Contracting as distributor for all GKN MILLS products in Saudi Arabia.

The distributor's address is P.O. Box 64, Damman and this appointment brings the number of countries in which GKN MILLS has either a trading partner, distributor or agent, to 38.

## Dick Peddie and McKay of Edinburgh have been appointed architects by the Scottish Development Agency, with the Agency's own design team as surveyors. Consultant engineer (services) are Ian Hunter and Partners of Edinburgh, with George Davie Crawford & Partners of Glasgow consultant engineers (structural).

## More school work for Turriff

WALSALL Metropolitan Borough has awarded a contract to Turriff Construction for phase III of Sneyd comprehensive school which extends the value of the contract to £3m. The company was awarded the original phases last year.

Built on a site created by reclaimed Coal Board land, the school is designed to take 1,500 students between the ages of 11 and 18 years. Completion is due in the summer of next year.

The building has a concrete frame with grey/buff brick cladding and certain areas constructed as totally sealed air-conditioned envelopes, to counteract traffic noises from the nearby M6 motorway.

## Insulation at the top keeps it warm below

WHAT IS described as a mechanical method of insulating lofts and roofs is now available from John Baker (Insulation), Henfield, Sussex (079 155 3561).

Company's managing director claims to be one of the pioneers of foam for insulating cavity walls in this country 20 years ago and the Superfoam system is based on a new aminoplast foam specially developed for roof applications.

All ingredients of the material are thoroughly mixed together after which the foam is laid, by means of a gun, between joists, leaving a crisp, even and white surface throughout the entire roof area. Foam is guided into awkward corners created by pitched roofs (often inaccessible to a man laying

## Small sewage treatment plants designed

FLEXIBLE SYSTEMS for the design and construction of small sewage treatment plants, which can take into consideration all the criteria relevant to individual applications (including site levels, space limitation and final effluent disposal) have been developed by Tuke and Bell of Horsham, Sussex.

In an example provided by the company in relation to an installation at a hotel remote from main drainage facilities, the equipment involved conventional biological treatment capable of handling a foul drainage flow of an estimated 15,400 litres per day.

Water Authority standards were met with a system where two-stage settlement tanks led to an aerobic filter bed and from there into a complex of humus chambers, pumpwell and return sludge pump.

Feature of the basic general arrangement in this instance was the augmenting of the flow by re-circulation of part of the treated effluent.

## Mothercat to build naval base

THE GOVERNMENT of Oman has appointed Mothercat to construct the Musandam naval base.

Value of the contract, scheduled for completion in 14 months, is about £3m.

The base is to be located on an island 3 km off the mainland. It is to be provided with a 100 metres-long piled jetty with a concrete deck and the contract also calls for barracks and offices. A small desalination plant will have to be installed.

It is understood that electrical work is likely to be subcontracted.

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LOMBARD A just way to cut spending

BY SAMUEL BRITTON

CUTTING PUBLIC spending is a fashionable subject in the UK. But the discussion has been far too narrow in focus. There are ways of cutting public spending which would in no sense discriminate against the poor...

The clue to such cuts is the fact that while some Government grants and subsidies are labelled as such, others are given in the form of tax reliefs. But whether a particular form of aid is counted as expenditure or a deduction from tax liability is often a matter of accounting niceties...

But in a balanced package which cuts subsidies for both council tenants and private owners, it would be possible to take far more than a nibble. Indeed such an overhaul would be justified if council tenants alone are singled out for treatment...

There is another aspect to the special reliefs. The combination of massive tax subsidies for pensioners and other groups with high taxes on ordinary investment income, means that no investor in his right mind will put money into a small firm while he can still increase his pension...

If we wanted deliberately to concentrate new investment in the hands of pension fund managers we could hardly have done better. A cut in the higher tax rate, which is all that we are likely to get next week, will go only a part of the way to removing the distortions...

The moral I am trying to draw is that the wrong way to criticise the Conservative package will be just to scream in favour of every threatened subsidy and tax cut. It would be possible to cut many kinds of spending and subsidy on items which are not actually public goods, while at the same time redistributing post-tax income towards the less well-off and also shifting power away from the big battalions...

But has anyone in politics had the imagination to see this? Nevertheless, used with discrimination, the list of tax expenditure can be of great help in securing an even handed scrutiny of state subsidies. Many apparently large items do not really contain all that much on close examination. It might be neater and clearer to replace capital allowances and other relief by a formula for calculating corporate tax liability which takes account of inflation directly, and also to have a lower rate of corporation tax; but much of the change would be one of form. Similarly the £1.3bn cost of capital gains tax relief for owner occupiers must to a large extent offset purely paper gains due to inflation...

The most clear-cut examples of allowances which are basically subsidies are the reliefs for pension and retirement annuity schemes, costing over £320m, for life assurance, premiums costing £29m, and for interest on home loans, which cost over £1.1bn. If these were gradually phased-out, the revenue gain would approach £2bn and it would be possible eventually to lower the basic tax rate by nearly 3p, or raise both the married and single allowances by nearly £250 or to more than double the child benefit rates. The mortgage, pension and insurance reliefs are simply a way of subsidising some char-

Taxing problems on the motorway

LONG-DISTANCE motorists who want to learn how the petrol and catering services on British motorways are financed will find much of their curiosity satisfied by reading the latest output from the House of Lords in a case, *Trucker Inspector of Taxes v Granada Motorway Services Ltd*. The less mobile armchair tax consultant will find some guidelines in trapping the elusive quality of the nature of payments for the purpose of computing tax.

The question in the case was whether a lump sum of £122,220 paid by the taxpayer to his landlord in order to secure a reduction in rent under a lease was deductible in computing the profits for corporation tax purposes. The disbursement was conceded to be wholly and exclusively expended for the purposes of the trade; but was it nevertheless a sum employed as capital in the trade? The hoary issue was whether the expenditure was of a capital nature (and hence not deductible from tax) or a revenue payment (and therefore deductible).

Granada operates three sites supplying goods and services to the public at motorway service areas. All three sites are held on leases granted in 1965 for 50 years by the Minister of Transport, now within the Department of the Environment.

The Government had already acknowledged in 1967 that such leases bore harshly on the operators and in subsequent years to other operators of service areas the gross takings had been defined so as to exclude tobacco duty as well as petrol duty. Instinctively sympathetic to the operators, the Department of the Environment agreed that

From this point of view it might be thought that the payment should be regarded as a capital payment. The latest judicial essay into determining what is revenue and what is capital has had a salutary effect. The courts have proclaimed that there is no single rule or touchstone that can be devised for distinguish-

THE WEEK IN THE COURTS

BY JUSTINIAN

THE LIABILITY for additional rent on tobacco duty would be computed by payment of a lump sum based on six times the amount of additional rent on tobacco duty for the year ending July 1973. The amount of £122,220 was the lump sum to be paid and calculated in this way. How was this money to be regarded?

The payment was clearly designed to enable the operators to earn bigger profits. From this point of view it might be thought that the payment should have a revenue character. On the other hand, the payment produced a modification in the lease which could be regarded as an identifiable asset, making the lease less disadvantageous.

As one of the nine judges who heard the case observed, the decisions of the courts in the past have provided an intellectual minefield in which principles are elusive and analogies are treacherous. Precedents, moreover, have proved to be vague signposts and the direction-finder is said to be the judicial common sense, to which the judge added the depressing postscript that the practice of judicial common sense is difficult in revenue cases. The case is also valuable for the burial of one other revenue shibboleth. The Special Commissioners (whose decision in

Tap on Wood looks likely

IN THE belief that Steve Cautley will again put his faith in Tap on Wood, I expect Willie Shoemaker to come in for the ride on Cracaval, leaving Ernie Johnson the mount on the third Barry Hills runner, Two of Diamonds.

If those riding arrangements come to fruition there is little doubt that Tap on Wood, the 2000 Guineas winner, a top priced 15-1 chance with Heathorns on Saturday but a 12-1 prospect elsewhere, will be in strong demand.

RACING

BY DOMINIC WIGAN

Although Yves Saint-Martin has ridden so many fine races at Epsom, it is the coming of Vincent O'Brien, Ireland's greatest post-war trainer, which has little prospect of real support for Cashel's Accomplice. O'Brien, who has often commented in the past that he would ideally like Lester to partner all his big race representatives but never ride for him in a serious piece of home-

work, commented last week that Accomplice's gallop on Thursday with Piggott on board had told him little. It was certainly an ironical comment by Piggott to land this of all Derbys, for Ireland with the Frenchman steering home a cast-off of the Classic's most successful rider. Of the 25 still engaged in the Derby, four—Le Marmot, Leodegrance, Morveta and Saracen Prince—are without jockeys. I suspect that Francis Bunting may pull out. Le Marmot, while Paul Kelleway will only saddle Saracen Prince if he is fully satisfied that the ground is good.

Although many people still hope that we will see the most appropriate Derby winner of all time in the shape of Billford, a colt trained by the Queen, Piggott by Piggott, and the National Stud stallion with, incidentally, a nomination presented to the Queen by Mr. Paul Mellon, it is worth repeating that Troy carries the principal hopes of West Islesy. But for the excitement building up over Epsom there is no doubt that there would be much more coverage over the out-

break of rhinopneumonitis—virus abortion—in the Newmarket area. The virus, which causes much suffering to mares, is highly contagious and the death toll has risen to five, with two new studs affected. In a joint statement issued by the Thoroughbred Breeders' Association and the Equine Research Station on Friday it was strongly suggested that mares and foals in the Newmarket area should not be moved until further notice. The statement read: "Due to the highly infectious nature of the strain of rhinopneumonitis which has affected mares on the Wood Ditton Stud (three of which have died and two been destroyed) it has now spread to two private studs in the area as a result of contact. We must urgently emphasise that mares and foals within the Newmarket area should not be moved away from studs until further notice."

HTV

1.20 pm Report: World Headlines, 1.25 Report: Wales Headlines, 2.00 Survival, 2.30 The Family, 3.15 The Underdog, 3.45 The Underdog, 4.00 The Underdog, 4.30 The Underdog, 5.00 The Underdog, 5.30 The Underdog, 6.00 The Underdog, 6.30 The Underdog, 7.00 The Underdog, 7.30 The Underdog, 8.00 The Underdog, 8.30 The Underdog, 9.00 The Underdog, 9.30 The Underdog, 10.00 The Underdog, 10.30 The Underdog, 11.00 The Underdog, 11.30 The Underdog, 12.00 The Underdog, 12.30 The Underdog, 1.00 The Underdog, 1.30 The Underdog, 2.00 The Underdog, 2.30 The Underdog, 3.00 The Underdog, 3.30 The Underdog, 4.00 The Underdog, 4.30 The Underdog, 5.00 The Underdog, 5.30 The Underdog, 6.00 The Underdog, 6.30 The Underdog, 7.00 The Underdog, 7.30 The Underdog, 8.00 The Underdog, 8.30 The Underdog, 9.00 The Underdog, 9.30 The Underdog, 10.00 The Underdog, 10.30 The Underdog, 11.00 The Underdog, 11.30 The Underdog, 12.00 The Underdog, 12.30 The Underdog, 1.00 The Underdog, 1.30 The Underdog, 2.00 The Underdog, 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THE ARTS

New End

Portrait of Dora

by ANTHONY CURTIS

Dora was one of Freud's earliest patients. She was an asthmatic who suffered from periodic bouts of loss of voice and nervous coughing. Freud regarded these as hysterical symptoms and probed into her memories to try to understand them. After three months of analysis she broke off her sessions with him; but he regarded her inconclusive case as worth writing up and publishing. His work with Dora confirmed the validity of the methods of treatment he was developing around the turn of the century, and he drew important lessons from the material concerning the nature of dreams, repressed desires, and so on. When she was 18 Dora had been taken by her father to stay in the Alps with a young married couple and their children. She was to have remained with them after her father's departure to Vienna but she decided to return with him, alleging that Mr. K, their host, had made an improper proposal to her while they were on an afternoon stroll around the lake. Freud went over this episode with Dora again and again, trying to determine what really happened, amplifying it with two subsequent dreams she has about the Ks. Freud came to believe not only that Dora was in love with Mr. K, but that her father had had an affair with Mrs. K, and that on an even more obscure, inconspicuous level Dora wanted to be the lover of Mrs. K identifying with her father. He also concluded that her sudden breaking off of the treatment with him after he had elucidated part of the mystery was a repeat of her abrupt departure from the Ks, prompted by her transference of her love or Mr. K to her analyst, a process which he had failed to understand at that time.



Caroline Langrishe and Sheila Gish

Revised plans for National's exhibition

The scope of the National Gallery's major loan exhibition for 1979 to be held from September to November 30, has been changed to concentrate on a single school of painting. The exhibition was to have been devoted to both Genoese and Venetian 17th century paintings, but will now consist only of Venetian paintings of the period. It will be retitled 'Venetian Seventeenth-Century Painting'. All the loans for the exhibition are coming from public and private collections in Britain and Ireland. It will consist of 53 Venetian 17th century pictures

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CRICKET BY TREVOR BAILEY

Cost of the Packer peace pact

APPLY, the bitter conflict between the cricket establishment and World-Series Cricket over so that for the first time in two years those England players with Packer contracts are available for selection for national 11. Predictably, our selectors are chosen to ignore them for the Prudential Cup and relied a those who regained the shes plus Gattling and Larkins. oth these talented youngsters re ideally suited to the requirements of this competition, but hether that applies to rearily and Boycott is less rtain. It was inevitable that the Australian Board of Control ould agree to a compromise hich suited Kerry Packer, ad will eventually fill their care-empty coffers. They were a financial trouble, as gate receipts for the series between ngland and their own colour- ss 11 were well down, while nks for both Tests and inter- ate games have risen dramati- ally. The two other tourists rable of drawing large rouds for genuine tests in Australia, the West Indies and

Premieres at Bath

by MAX LOPPERS

Even by its own standards, the Bath Festival has been this year a brilliant success, a mixture calculated to a nicety by William Glock to stir, stimulate, and delight on many fronts. Had there been no more than the two new works by Tippett and Elliott Carter, presented at either end of the Festival, it would have been an exceptional Festival, with Bach, Handel, Maxwell Davies, Michael Finnissy, and liberal doses of chamber music and solo recitals by performers carefully chosen for their special qualities, the cup ran over. Carter's Springs is dedicated to Sir William and Lady Glock; it had its first performance in New York last December, and its first European performance—Sarah Walker, Neil Howlett, and 11 players of the Nash Ensemble under Lionel Friend were the expert participants—in the Guildhall last Wednesday. It follows on from Carter's A Mirror On Which To Dwell, the song cycle of the middle 1970s that marked the composers return to the human voice after so many years of purely instrumental exploration and innovation. The newer piece might, however, be described as two song cycles, which happen to be performed simultaneously, in a manner that amounts to a simultaneous re-telling and re-examination of the Orpheus legend. The mezzo-soprano sings John Ashbery's long, wittily phrased, beautifully poetic examination of the legend and its later recurrences and significances; the bass-baritone is given ancient Greek texts, declaimed in the original, which Carter himself culled from Plato, Mimnermus, Sappho, Aeschylus, and Ibycus in order to create "the subliminal background that might be evoked in the mind of a reader." Separately and simultaneously, sometimes in concord and sometimes in conflict, the voices pursue their courses. Tensions are set up between them, and between the two languages, types of music, worlds distinctly brought into being, in such tensions one senses the typical Carter ebb and flow of argument. As ever when faced with a new Carter piece, one's first impression was of bracing energy, tight-packed invention, muscular instrumental interplay, an overall elation of the mind and the senses. In the Guildhall, whose reverberant acoustics blurred a good deal of the inner detail, such an impression was all that was allowed. Though the performance seemed confident, and by the soloists (and by Timothy Walker's guitar, an important solo element) the lines were lyrically and meaningfully shaped, I could not make full or satisfying contact with the "tender, lapped melodies" that Andrew Porter praised when he wrote about Springs on this page in January. No need to worry, Carter inspires trust—one knows from past experience that pieces dense and confusing on first hearing reveal their subtleties and beauties soon after. I look forward eagerly to the Nash Ensemble's first London performance later in the year.

Festival Hall

Argerich by NICHOLAS KENYON

London appearances by Martha Argerich have become so rare in recent years that each turns into an event. At an age when she might be living the Concerto Commuting Circuit, Miss Argerich has, instead severely restricted her concert performances. I presume that it is a matter of choice on her part, for after an account of Prokofiev's Third Concerto such as she gave yesterday afternoon with the London Symphony Orchestra, there can surely be no orchestral promoter in the world who is not begging for her services. In the last Leeds Piano Competition but one, this thundering Prokofiev concerto was played not only by the winner but by

Elizabeth Hall

Stephen Bishop-Kovacevich by DAVID MURRAY

There are a few pianists with the happy knack of compensating for the acoustic oddities of the Elizabeth Hall, but generally a piano sounds a little awash there, as Mr. Bishop-Kovacevich did yesterday afternoon. He took a characteristically personal, introspective line with his Beethoven and Schubert, and the delicate pedal-buzz he seemed to intend often became a thick mist. Beethoven's scrupulous markings in the op. 101 Sonata—carefully indented phrases, light staccato basses, dotted figures with a rest in the middle distinct from those without one—were blurred away into a universal legato. The main subject of the Finale (di-di-di-da) sounded less bright and infectious than usual as "de-da, di-di-di-da." Fortunately, the pianist's thoughtful tenderness with the music made for a reading of

fragment in the finale (done without a trace of skittishness, the tone biting into the keyboard). And in the brilliant sections, Miss Argerich's finger articulation sang further into the piano than many other pianists' elbow weight. Michael Tilson Thomas conducted the LSO with a cold, vital precision which suited this work. He also directed Chai-kovsky's Manfred Symphony and Mussorgsky's Night on the Bare Mountain—in the latter we practically froze to death. The clarity of his clipped beat brought nothing we had not heard before from the LSO players, and failed to encourage the warmth and drama in the music.

King's Head

Fearless Frank by MICHAEL COVENEY

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Fonteyn to present BBC TV series on ballet

Margot Fonteyn is to introduce and narrate a BBC Television series about ballet, to be screened this autumn on BBC-2. Called The Magic of Dance, the six-week series will present her personal survey of dance from the time of Louis XIV, at the Court of Versailles to the present day. Separate programmes will concentrate on different epochs in the history of dance. Fonteyn herself will be seen dancing one of her most famous roles, in a complete performance of Marguerite and Armand. A wealth of archive documentation and film is to be included in the series, which includes sequences filmed in Shanghai, where Margot Fonteyn spent most of her childhood, until she left to join Sadler's Wells; Greece, where she goes to explore the legend of Isadora Duncan; Hollywood, where she meets Fred Astaire, and talks to Sammy Davis Jr. about tap-dancing; Sweden, where she visits the last remaining theatre in the world where ballets are performed just as they were over 200 years ago, and also includes material shot in Russia, Spain and Italy.

TENNIS BY JOHN BARRETT IN PARIS

French revolution in facilities

THE MANY thousands who have flocked to last summer at the new U.S. tennis centre at Flushing Meadow in New York. In three weeks we shall be hearing about the impressive modernisation and extension at Wimbledon and in August there will be the opening of the \$7.5m Indianapolis sports centre, the brain-child of former USTA president Stan Malless. At the last 16 stages in Paris, there is a look of ominous precision about the men's favourite, Bjorn Borg of Sweden, who, as at Wimbledon, will have the opportunity to write a page in the game's history. No other male player has won four times on this slow red dirt which surely must be the most demanding surface in the world—at least physically. Borg, just 23, is in his prime. After a careful start against Tomas Smid of Czechoslovakia and a difficult win in four sets against Tom Gullikson, the left-handed of the American twins, there seems little evidence of the groin injury which forced his withdrawal from the German Open in Hamburg two weeks ago. Poor Ray Moore of South Africa could win only

four games in three sets against him on Saturday. If John McEnroe, the sensational young American left-hander, makes the same speedy recovery from a similar injury sustained in Tokyo—a misfortune which kept him out of Paris—the anticipated clash between these two at Wimbledon will have a special edge to it because Borg's chance for immortality hangs on the capture of a fourth consecutive singles title. The top Ladies' seed, Chris Evert-Lloyd, has been only slightly less impressive. After two successful rounds where a mere seven games were lost, there was a recovery lapse on Saturday of the temporary lapse in concentration which has afflicted the world champion's game since she resumed serious competition following her April marriage to Britain's John Lloyd. That she should have lost a set at all to the young Argentine Ivana Madruga was in itself noteworthy but that it should have occurred after an initial lead for the American of 4-0 was astonishing. However, that temporary lapse apart, Mrs. Lloyd continues the week-by-week improvement on her favourite clay surface that began with the Federation Cup in Madrid last month. The loss in Rome to the little American Tracy Austin that ended the 125-match winning sequence from 1973 was probably a relief and in the absence of both Miss Austin and the self-exiled Czech, Martina Navratilova, the two most serious challengers to her crown, I shall be surprised if the 24-year-old American does not win her third French title, adding to those she won in 1974 and 1975, the last time she played in Paris. Impressive as this would be, Mrs. Lloyd would still have some way to go to equal the prodigious feats of the remarkable Australian, Margaret Court. Over a period of 12 years, first as Miss Smith and then as Mrs. Court, she collected 24 titles at the four major singles championships, won 18 in doubles, and captured 17 mixed titles. If you include the championships of Italy, Germany and "South Africa, her trophy bag contains an astonishing 90 titles.



Tina Jones

Young Vic

What the Butler Saw by ANTONY THORNCROFT

When Joe Orton's last play, What the Butler Saw, was first produced, two years after his Ortesque death, there was uproar in the gallery and Sir Ralph Richardson found himself booed by puritans and patriots. Now, a decade later, it nestles happily in the Young Vic repertoire, attracting the kind of youthful and family audience which has recently laughed at Charley's Aunt and The Importance of Being Earnest in the same theatre. Orton is a conscientious successor to both, with epigrams which are the equal of Wilde's, and much less affected, but what comes over most strongly is the good humour of it all. Even the police are here treated gently. By the end the frenzy may be getting rather exhausting, and the imagination flagging, but rarely can there have been such a well-written romp; some of the lines on sexual politics, a rich field of irony for Orton, are treasures. The 1968 production featured heavies like Coral Browne, Stanley Baxter and Julia Foster, as well as Sir Ralph, and the theatrical establishment's way of acknowledging Orton's genius. This version veers towards the lightweight. There are, however, good performances by John Darrell, as the head of the clinic, who attempts to remain rational amid the irrational; and Tina Jones and Philip Davis switch clothes and sexes effectively. Kate Versey is a credible nymphomane, and on a solid hard-working set the direction by Michael Attenborough, his first for the Young Vic, is unmanipulated, allowing the play to speak for itself, a masterpiece of civilised hysteria.

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# THE MANAGEMENT PAGE

## Frank Lipsius outlines how a company that once dominated the U.S. canning business has recently shifted towards consumer markets

# How American Can recorded a change of direction

IN THE 1960s, when the post-war baby boom produced a generation of new teenage consumers, no business attracted more corporate attention than music, notably pop music.

The business is still mushrooming—it is growing five times as fast as the American gross national product—but it has not been without its attendant dangers, as some companies found to their expensive and embarrassing cost.

When Gulf & Western, the conglomerate which purchased Paramount Pictures, brought a record company, Paramount Dot, the corporate chairman promised fantastic growth.

Paramount Pictures is thriving under Gulf & Western, but Dot—which proved unprofitable—was long since sold to the television-network ABC, another entertainment conglomerate lured by the siren sound of music. With its network ratings dominating television, ABC had some justification for assuming it knew consumer tastes. But earlier this year it too gave up and sold its record company to yet another entertainment company, MCA, which was willing to try its hand at mining the rich vein of musical gold.

The roller coaster of pop music would seem to be particularly far from the corporate concerns of the American Can Company—64th in the Fortune 500 directory—which for many years dominated the canning business. But since a disastrous year in 1971, when profits slumped by 22 per cent, American Can has singlemindedly pursued a goal written in bold type in the new annual report:

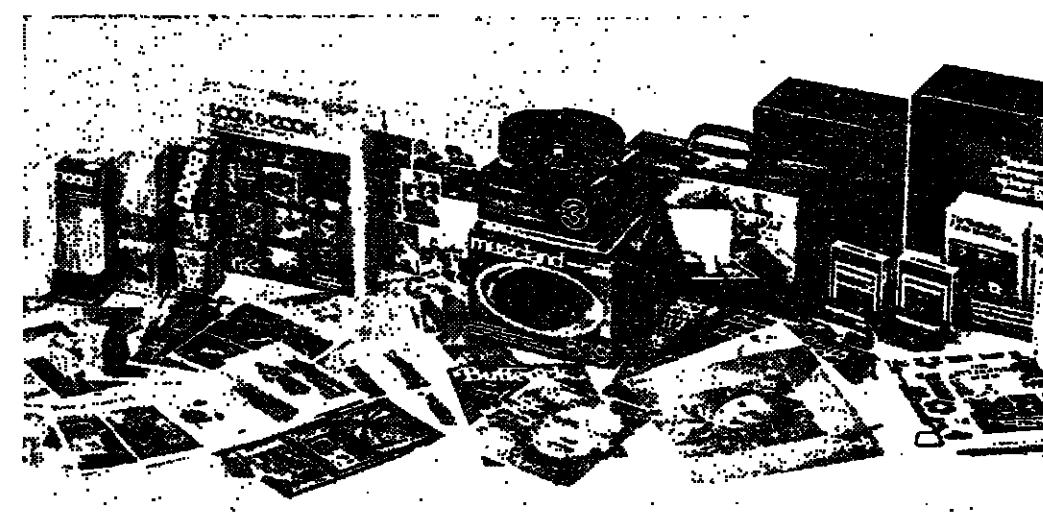
"Our objective has been to position ourselves in an expanding number of high-growth consumer markets." To emphasise the point, the report itself is entitled American Can and Tomorrow's Consumer.

So far the strategy has paid off handsomely, with earnings last year of \$119.9m, or \$6.05 a share, compared with \$5.48 a share in 1977, a gain of 10.4 per cent. Since 1971, the growth in earnings per share has been 150 per cent, despite a 25 per cent decline in the volume of the metal can business. Over the same period the company's total sales revenue has increased by over 110 per cent to \$3.98bn.

The major acquisition in its diversification drive—in sales terms—has been Pickwick International, the largest wholesaler of records in the United States, which also owns several labels of its own. Bought in April, 1977, for \$102m in cash, Pickwick has grown from a volume of \$260m in the year before the acquisition to \$1bn today. Pickwick handles one out of every five records bought in the U.S., claims Lionel Sterling, senior vice-president of American Can and chairman of Pickwick.

Part of that growth has come through acquisitions, including the 28-store Sam Goody retail chain, where the youthful 41-year-old Sterling admits with a smile—he was a 15-year-old stockboy in the original Sam Goody store in New York.

In managing to get into the record business as a wholesaler, without worrying about what particular record is top



Pickwick International has given American Can a strong position in the record market and an entry into many other consumer markets as this display illustrates.

of the pops, American Can is following the consistent pattern it established over 10 years ago. Its other consumer products now include such staples as Dixie Cups (paper cups), toilet paper and plastic spoons. The company buys more Paris fashions than anyone else, mass producing them as patterns for women to sew at home.

American Can dominated the tinning business from the beginning of the century, when the company was founded as a monopolistic amalgam of over a hundred canning firms. But it gradually relinquished primacy in the field to Continental Group (formerly Continental Can); now instead it concentrates on specialised

packaging (by no means just cans), where the profits are greater and the technology more advanced. Since 1972, 88 plants have been shut down and though another 45 were opened, "we've been shutting down horse-size and opening up rabbit-size," according to William Woodside, president of American Can.

In the music business, American Can has entered a field still largely dominated by entrepreneurs, especially in retailing and wholesaling. The biggest retail chains account for less than 10 per cent of the country's 11,000 retailers.

At one end, American Can has consolidated Pickwick operations in a 41,000-square

foot headquarters in Minnesota where 32 articulated lorries can unload indoors simultaneously. At the other, it has increased the number of its retail stores by more than 50 in the two years it has owned Pickwick.

Another 75 are on the drawing board, reflecting a trend in the music industry away from middle men such as rock jobbers. When American Can bought Pickwick, 60 per cent of Pickwick's business was in rock jobbing where it supplied the record departments of retail giants like Sears and Woolworth's.

Since Pickwick's retail stores are concentrated in the same shopping malls that accommodate major retailers like

Sears which also sell records distributed by Pickwick, a potential conflict exists. According to Chuck Smith, the president of Pickwick and its chief operating officer, the presence of both is actually good for business. "Stores of various configurations appeal to different market segments."

Handling some 20 per cent of all records distributed in the U.S. and part of a corporation which is bigger than the entire country's music business, Pickwick has aroused some suspicion—and even hostility—for its size and continued growth. But Lionel Sterling stoutly defends the company's presence in the music business. He sees the parent company's role as that of a management consultant for its subsidiary.

In this way American Can has helped establish a new division, Information Systems and Services, which will allow computers to make Pickwick's retail outlets, both in rack operations or their own stores. The computer will process information about an impending rock concert in one city and the request for one record in another. Any customer request should be filled within a day.

Incentive schemes for employees have also been introduced, along with five-year strategy planning under the direction of a recruit from the accounting firm of Coopers and Lybrand.

Consolidating Pickwick headquarters in Minnesota broke a pattern that reflected the company's disparate origins: a large budget label run from New York, a wholesaler in

Minnesota, and various retail chains that were acquired along the way. American Can increased the size of the headquarters and also added other regional outlets, which now number 17.

The acquisition of a west coast distributor, MS Distributors, led to a boycott from retailers who did not want to be supplied by a competing retailer. The boycott continues with one 23-store chain, Tower Records, but has had little impact on Pickwick or the attitudes of other retailers.

In its manufacturing operations, Pickwick has continued to expand its repertoire of budget material. Recently Czechoslovakia's Supraphon Records was licensed by Pickwick for its classical "Quintessence" line. The Pickwick record line itself now constitutes only 10 per cent of its business.

American Can has not quite escaped the vicissitudes of the record business, despite its handling all companies' records. As the country's largest regional distributor of independent labels, Pickwick lost the franchises to distribute A and ABC Records, which ceased being independently distributed in January. Pickwick will continue to handle those records, but not under the advantageous terms of a distributor, a change that Lionel Sterling calls "insignificant" in budgetary terms. Though A and M and ABC were two of the largest independently distributed companies, Sterling considers independent distribution still viable and an important service Pickwick provides for the smaller companies that were the back-

bone of the record business in the 1960s and 70s.

For the future, Pickwick will continue to adjust its operations to meet consumer demands. Long-term projections foresee a greater demand for hardware, both in audio equipment and the home computers that will provide future home-entertainment centres. Pickwick retail stores will begin to carry the computers and other new technology like video discs and tapes. American Can's most recent acquisition, the direct mail-order house of Fingerhut, will help Pickwick enter the mail-order business, which represents 14 per cent of all record sales and yet has only one major brand-based supplier in CBS Records.

Expansion potential also exists in Europe, using the British operation under Monte Lewis as a base. While the major manufacturers provide their own direct distribution channels, Pickwick International does have a fleet of Mercedes lorries, each stocked with 10,000 records for supplying about 9,000 British retailers. Pickwick's budget label controls 60 per cent of the British record market, which itself is 12 per cent of the British record market. Attracted by the growth rate of 13 per cent in European record sales, Pickwick International expects to move across the Channel in the manufacturing business, if not distribution as well.

Should it reproduce its performance in the U.S. and Britain, Pickwick will soon have a profitable, if not fashionable, music business on the Continent as well.

### EXECUTIVE HEALTH

BY DR. DAVID CARRICK

## Ailments of the fanciful variety

I WONDER how much it cost the Government (which means us) to carry out the "General Household Survey 1977," the results of which were published recently? The report arrived at the astonishing conclusion that over 50 per cent of all men questioned and no fewer than seven out of 10 of the women had (or more likely fancied they had) some chronic illness or other.

As the results took two years to produce, I imagine that the sum involved was considerable and possibly could have been devoted to some more worthy cause. The result was all so very predictable. Started as the surveyors in their naivety may have been, anyone with

the slightest knowledge of people and history could have supplied guesstimated figures free of charge. And those figures would not have been so very far out because man and his ailments, fancied or otherwise, have changed but little during the entire period of recorded history.

Plato in 350 BC, doubtless worrying about what the year 379 would have in store for him, was well acquainted with human frailties, for he wrote: "... a man is always fancying that he is being made ill, and is in constant anxiety about the state of his body; the great philosopher having in mind, no doubt, the dangers of air pollution caused by the smog arising

from the many charcoal-burners on the outskirts of Athens.

The great English physician, William Heberden, whose long life all but spanned the whole of the 18th century, wrote with similar feeling about hypochondriacal complaints, stating that they: "resemble the gout, and madness, and consumption, in their not appearing before the age of puberty." Although a somewhat sweeping and not entirely accurate claim, Heberden may well have been feeling irritated by the large number of wealthy valetudinarians (Dr. Johnson included) who spent much of their time moaning about their illnesses in the coffee-houses of London. These views were supported

by a less eminent colleague, Dr. Buchan, a general practitioner, who wrote in 1760 that hypochondria: "generally attacks the indolent, the luxurious, the unfortunate and the studious," adding that the disorder "becomes daily more common in this country, owing, no doubt, to the increase of luxury and sedentary employments." He might have taken part in that recent survey!

But there are two differences in these modern days. Firstly, surveyors cover all social classes (unlike those quoted above) and, secondly, executives and their helpers—a group I call the crushed commuter class—did not really exist as such in the long ago. By the late 19th century,



however, they most certainly did, and it was to them that the advertiser of patent medicines which claimed to cure anything from piles to psittacosis, aimed his words, because anyone stuck in a railway carriage or horse-drawn bus, could not fail to dwell upon the legends intended to influence him and charm the sovereigns from his pockets.

The "General Household Survey, 1977" did show, however, that chronic illness (or did they mean absence?) is much less common in professional people than in unskilled workers.

Agreed, and I would like to pay tribute to the fortitude and remarkable devotion to duty that is shown by 90 per cent of office-workers, of all ranks, who manage to struggle on in a most admirable fashion in the face of considerable adversity.

In a recent radio interview, I was asked questions about this, but I was a little bothered by the interviewer's query: "What would you do if an exec. (sic.) came into your consulting room and asked you to pronounce him fit?" As such a thing had never happened to me, I fought

### Is anybody still there?

IS absenteeism a problem in your company? Do you even know whether it is a problem? Because absence from work is less immediate than an industrial dispute it attracts less management attention, yet it may account for considerably more time off work than the latest British Institute of Management checklist.

"Managers should recognise that effective management control can affect absence levels. They should find out the conditions that cause absence, where it occurs and which individuals are involved. To do this it is essential that systematic records are maintained," it says.

It adds that there is evidence many employers do not see absenteeism as a problem, but this may be because they are ignorant of the true situation in the company and of comparable levels outside. Alternatively there may be an administrative failure to differentiate between genuine and improperly accounted reasons for absence, it says.

\* Controlling Absenteeism, BIM Checklist No. 80 from BIM Publications Sales Department, Management House, Parker Street, London, WC3B 5PT. 75p (50p to members).

### Business courses

Managing Maintenance Work (an advanced course), Colchester, Essex. July 23-27. Fee: £385 (inclusive). Details from Management in Action, 121 St. James's Drive, Wandsworth Common, London SW17 7JZ. A visit to the course. Briefing, 1979, London, July 5. Fee: £55 (plus VAT). Details from Risk Research Group, Bridge House, 131 Queen Victoria Street, London EC4V 4DD.

International Program for Senior Executives, Geneva, August 27-31. Fee: SFR 5,500. Details from The Administrative Centre of Etudes Industrielles, Chemin de la Suisse, CH-1231 Geneva.

Personnel Management Course, Brussels, August 27-31. Details from Management Centre, 131 Avenue des Arts, B-1040 Brussels, Belgium.

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#### Tuesday 26 June

The Economic Indicators  
Speaker: Michael Shanks  
Chairman, National Consumer Council

The Spirit of Free Enterprise  
Speaker: Sir James Goldsmith  
Chairman, Cavenham Group Ltd

Enterprise in a Mixed Economy  
Speaker: The Rt Hon Sir Richard Marsh  
Chairman, Newspaper Publishers Association

Developing a Competitive Strategy  
Speaker: C. C. (Michael) Pocock  
Chairman, Shell Transport and Trading Company Limited

Any Questions?  
Chairman: David Jacobs  
Panel: Sir Mervyn Fynniston, Lord McCarty, Sir Richard Marsh, Katherine Whitaham

Sectional meetings arranged by the SPUR institutions will take place on 27 and 28 June

Full Details from Conference Department  
British Institute of Management  
Parker Street, London WC2



#### Wednesday 27 June

People and Performance  
Speaker: Sir Hector Laing  
Chairman, United Biscuits Ltd

Effective Performance - Structure and Attitudes  
Speakers: Sir Harry Moore  
Chairman and  
Dr A. Frankel, Chief Executive  
Staveley Industries Limited

The Rt Hon. Sir Keith Joseph, MP,  
Secretary of State for Industry,  
makes his first major speech to UK  
management on 27 June.

#### Thursday 28 June

The Fiesta Story  
Speaker: Keith Prickett  
Marketing Director  
The Ford Motor Company Ltd

The Challenge of World Trade  
Chairman: Professor Robert McKenzie.  
A presentation by the British  
Overseas Trade Board

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Joseph P. ...

# Reality is the moment when one buys a BMW rather than a car.



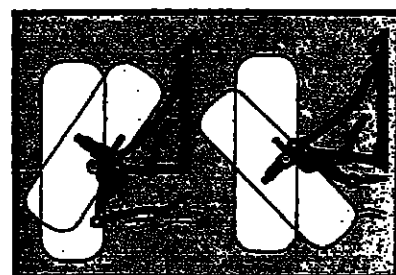
Compromise, in automotive engineering, seems to be the rule rather than the exception. BMW regard this as unnecessary. As soon as one closely examines or drives a BMW one realises that it is the sense of balance, not compromise, that gives a BMW its unmistakable character.

The BMW 7 Series are luxury cars. The discreet design reflects the solid quality found throughout. It is that certain kind of quality that one takes pride in. It offers other, more practical, advantages. Inside there's a sense of quiet spaciousness. The seats and ventilation encourage a relaxed alertness rather than soporific comfort and on today's crowded roads this is an important aspect of active safety.

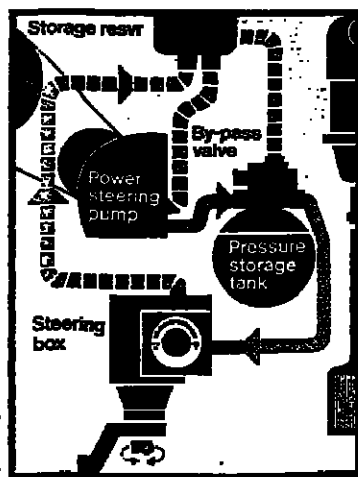
Whilst the 7 Series are refined luxury cars they are, equally, drivers' cars. The three models in the range offer three different engine capacities—2.8, 3.0 and 3.3 litres, the latter with electronic fuel injection. Each produces very

high power to litre ratios. The chassis, with its new double pivot front suspension, offers handling incomparable in this size of car. The power steering is speed-related.

As the engine speed increases a pressure relief valve draws off hydraulic fluid before it reaches the power steering box. The result is



Double pivot front suspension.



Speed-related power steering.

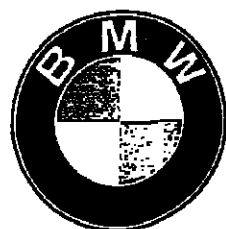
that one gets maximum power for steering at parking speeds, then diminishing assistance as speed increases to give greater road 'feel'. However, if at speed the front wheels hit severe bumps, or a tyre deflates, then the steering power immediately increases again to cope with the extra forces created.

This attention to design is found throughout the BMW 7 Series. The sum of them all make the realities of driving an exceptional pleasure.

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Some clouds gathering over the Gulf

BY ALAIN CASS

Time for U.S. leadership

THE U.S. has not faced up to the "long-term, chronic problem" of its excessive energy consumption. It will have to live with the prospect of shortages until it introduces policies that will cut back demand, reduce waste and ensure maximum production at home.

Seriously in question

That leadership is now seriously in question. A week ago, an unimpressive president is being urged by Congress to lead by example.

Inflating allies

Last week, the Carter administration itself moved to increase imports of heating oil into the U.S. in order to build up stocks for next winter.

Conference kettle subsidised pot

THE BRITISH Government's strong rebuke of the U.S. authorities over a grand jury decision to indict criminally seven transatlantic shipping groups is understandable and will no doubt be echoed by other governments with strong maritime interests from Stockholm to Tokyo.

The indictment is, at its simplest level, another example of the U.S. applying its anti-trust laws to companies and individuals whose trading base is in a country where those laws do not apply.

In terms of the shipping industry, however, the issue is more complex and more important, especially at a time when the UNCTAD conference in Manila has again illustrated the pressure which exists in the developing world against the way that the developed countries run their shipping affairs.

The latest row with the U.S. authorities is over the degree to which shipping lines should be allowed to operate strong conferences to fix cargo rates, determine levels of service and apportion investment in new ships.

THE U.S. and the backers of its policies in the Middle East seem set on a collision course with their traditional allies in the area. These allies are the oil producers who between them account for more than one-third of OPEC production and upon whom the economies of the industrialised world depend.

It now seems clear that for all the desperate efforts to paper over the cracks, relations between Washington, Kuwait, and the lower Gulf States, with the exception of Oman, are at an all-time low.

Sheikh Ahmed Zaki Yamani, Saudi Arabia's oil minister, came as close as he decently could to saying as much in an interview in Washington.

The oil sheikhs are almost uniformly hostile to the peace treaty between Egypt and Israel, angry with Washington for ignoring their warnings, and puzzled that so little effort was made to win them over or to understand the extreme vulnerability of their present position.

Part of the problem has been that the Gulf Arab, a reticent and sometimes aloof bedouin, is given to excessive politeness. But that is only part of the reason why the U.S.—having failed to foresee the Iranian upheaval—now appears to have incorrectly judged the mood of Saudi Arabia and the Gulf.

The major problem may have been a strong element of wishful thinking both in Washington and elsewhere. Because the Saudis and the other oil sheikhs are deeply conservative, because they fear Soviet intentions in the Gulf, because they would like to be rid of the Palestinians, because their own economies are now inextricably linked to those of the West and so on, a recession in the West could eventually endanger their own positions.

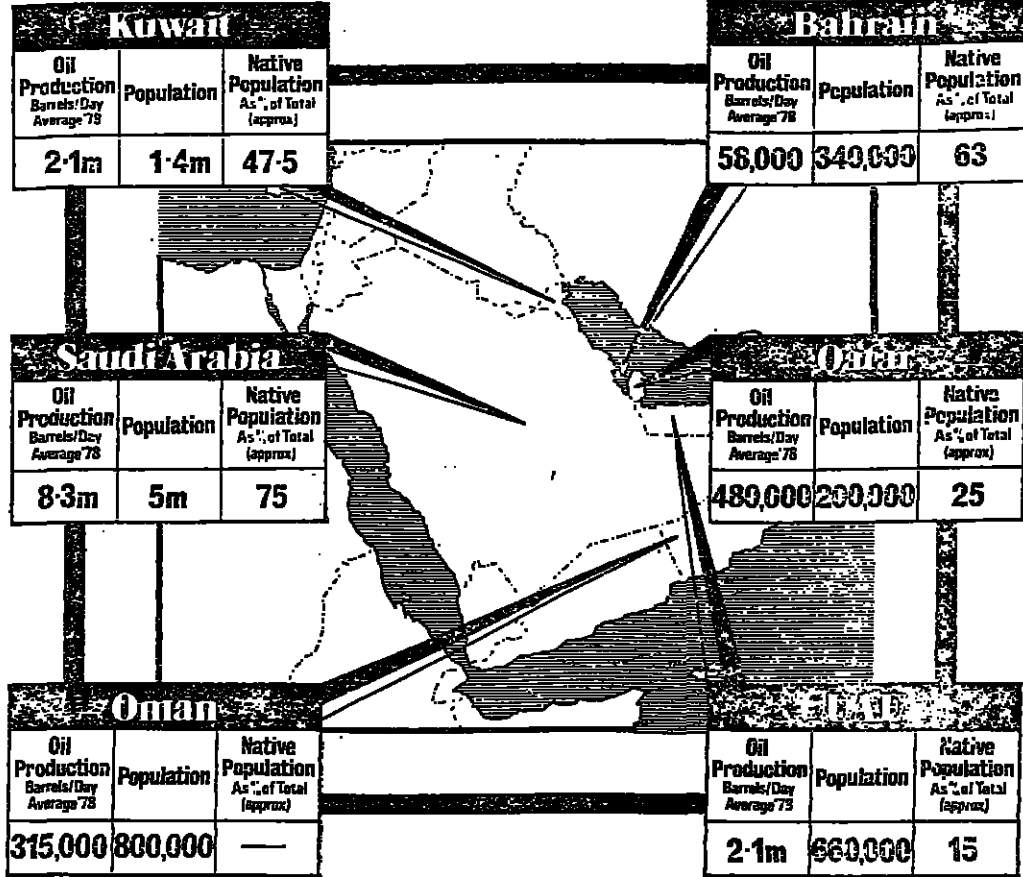
It is not surprising that the Gulf Arab, a reticent and sometimes aloof bedouin, is given to excessive politeness. But that is only part of the reason why the U.S.—having failed to foresee the Iranian upheaval—now appears to have incorrectly judged the mood of Saudi Arabia and the Gulf.

One banker claimed that, in the space of a month, three Kuwaiti families invested \$100m abroad in real estate. The exodus has since slowed but is still running at a high level partly because of the strength of the dollar and of sterling.

The continued unrest in Iran is deeply troubling to the Arab regimes of the Gulf. Some believe that Iran—like Iraq before it—may take years, possibly decades, to stabilise. The latest fighting around the major Gulf port of Khorramshahr between Iran's discontented Arab

hotel staff is seemingly very religious and viewed the sunbathing as an insult to their Islamic susceptibilities. Evelyn Y. Davis of Washington, who is elegant, attractive, and sharp-tongued, she makes a habit of addressing chairmen by their first names and complementing them on their looks, and last hit the news at the recent annual Ford meeting, where she proposed that there should be more members of the Ford family on the board.

Neither type of gaffly is very popular in corporate boardrooms: the Institute of Investor Relations Managers holds training courses on how to deal with them. Solar energy may be moving rather sluggishly towards solving the world's energy woes—but a Hollywood, California, company is cashing in at a modest commercial level.



minority and what passes for the country's central government must reinforce that impression. For Saudi Arabia, Kuwait, the United Arab Emirates, Qatar and Bahrain—though not Oman where the issue is of a different order—the major problem has been how to cope with the consequences of unprecedented rates of economic growth, avoiding the social and political dislocation it caused in Iran.

The boom years of 1974-76 are over. A combination of soaring inflation rates, major dislocations of ports and road transport, the virtual collapse of the building industry in some countries, the erosion of their purchasing power due to the decline of the dollar and intense political pressure to conserve

Building activity in the UAE has all but collapsed. Hotels are barely half full. There are reliably said to be fewer than 800 construction companies left in operation against 2,500 in the boom years. Dubai is barely recovering from a banking crisis which seriously shook confidence in its role as a service centre.

Qatar remains profoundly cautious and is unlikely to rush into a decision to develop its monster West Dome natural gas field. In Bahrain the growth of offshore banking units has levelled off and the economy shows little sign of picking up before the construction starts on the \$1bn causeway to Saudi Arabia.

Corruption and economic mismanagement which were major issues in Iran have become live topics. The almost complete absence of a regional development policy, of any attempt to co-ordinate industrial projects or identify markets has focused criticism on the petty, tribal jealousies which so often dictate major decisions of the ruling oligarchies.

Why did Dubai build the world's biggest dry dock when Bahrain already has one? Why will the UAE soon have five international airports? Why has Sheikh Rashid insisted on proceeding with the construction of Jebel Ali the 68-berth port which, like the Dubai dry dock, looked like being a white elephant before it left the drawing boards?

For how long can Sheikh Rashid persist in running his emirate and dispose of its \$3bn annual income as if Dubai were a family concern? Some Gulf countries have been more successful than others in satisfying the expectations generated by oil, and are consequently less vulnerable to internal upheaval. Kuwait, with the highest per capita income in the world, is probably the best example. Others, such as Saudi Arabia, have tradition and tribal cohesion as well as a subtle balance of political forces and the apparatus of a police state to protect the rulers.

But the need for internal change to meet the challenges of the political awakening which followed the Ayatollah's Iranian revolution is increasing. The pressure on Kuwait and Bahrain to restate their suspended parliaments will grow. Persuasion by the Saudis, who would see this as an eventual threat to the legitimacy of their own ruling family, may delay moves towards a form of democracy but not indefinitely.

The decline of the National Health Service has ceased to shock me, but things have gone further than I thought. According to the Civil Service union magazine Red Tape as official's report on a social security claimant in Carlisle mentioned in passing that "claimant had been admitted to hospital but was discharged immediately because of illness."

The huge number of expatriates in the Gulf also is a worry. Many are Palestinians (400,000 in Kuwait alone)—hence Kuwait's stand against the peace treaty. Others are increasingly frustrated by nationality laws which effectively relegate them to the status of second-class citizens.

Russian intentions are a major concern. Having won over Ethiopia and South Yemen, will the Kremlin now threaten Oman by rekindling the Dhofari rebellion which the Sultan of Oman, the British and the Shah defeated only after a prolonged war of attrition?

The question is of vital importance to the West since the Musandam Peninsula at the neck of the straits of Hormuz is owned by the Sultan and watches over some 100 tankers a day carrying oil to the industrialised world. The U.S. is worried enough to have stationed a fleet of Oman and to be seriously thinking of stepping in with substantial military aid if Britain's support of Sultan Qaboos should waver.

One Kuwait minister reacted by saying: "Frankly, this annoys me. Who are they going to protect us against? The Russians? Then we are talking about a major war, which is not reassuring. Our own people? We are in their hands. The Americans should understand that we cannot afford their open support after what happened in Iran."

It is hardly surprising that against this turbulent and confused background the Gulf states, which now regard overt U.S. support as a political liability, are unwilling to help the West out of its energy predicament.

The major question is how far they are willing to risk their own interests by forcing up the price of oil or limiting production, or both. The ruling families are all deeply conscious that, in the final analysis, their own survival depends on the economic stability of the West. They have not forgotten that the oil embargo of 1973 and the quadrupling of oil prices which followed was a major shock to the economies of the industrialised world and that the repercussions were felt in the Gulf.

The need now is for a new balance in the relationship between the West and its natural allies in the Middle East which gives the Gulf stability and the West sufficient oil. It involves, among other things, a reassessment of U.S. Middle East policy, an urgent need to tackle the Palestinian problem and a Gulf Security pact.

The third element of a new relationship between the West and the oil producers would be an effective set of energy conservation measures which would give Saudi Arabia, for one, the political excuse to maintain high production levels.

It is unlikely that any of this can be done in time to make any difference at the next OPEC meeting in June. But it is something the leaders meeting in Tokyo at the world summit should reflect on.



Dubai's Jebel Ali port—white elephant before it left the drawing board? Terry Kirk

MEN AND MATTERS

Out-of-court Jay stays put

Peter Jay, the outgoing British Ambassador to Washington, is not going far—he is moving about a mile up the road from the embassy on Massachusetts Avenue, where he will be settling down to work on his magnum opus on global market socialism.

Jay has always said that, once the diplomatic posting was over, he wanted to write his book. The main question has been where and under whose auspices. It seems he has now received a grant from an American institution (probably the German Marshall Fund) and been offered office space at Brookings, the great American think tank.

Some students of diplomatic form point out snidely that it is "irregular" for a former ambassador to remain in the city of his posting. Such niceties are, however, unlikely to worry either the Jays or Sir Nico Henderson, the new man (who appears to have got his own shorter opus out of the way).

gather Jay's main regret at leaving the embassy is the loss of his automatic right to use the tennis court. It means that, like the rest of tennis-mad Washington, he will have to queue and wait for court space with everyone else.

Having closed the bars and nightclubs, Iran's new Islamic government is now shutting another door on western decadence. Air France air hostesses, almost the only women staying at the Tehran Intercontinental, are no longer being allowed to flaunt their bikini-clad figures around the hotel's swimming pool.

Jetting gafflies

With the annual meeting season under way, British managers may be grateful that they are spared the attentions of those who, in the U.S. are known as "corporate gafflies."

One of the most active is Lewis D. Gilbert, patron of his brother John J. Gilbert owns a wide portfolio of shares, and runs an organisation called Corporate Democracy Inc., a not-for-profit corporation. It has democratically sent me a copy of its 39th annual report, from which I learn that it is devoted, among other things, to forcing companies to hold their meetings in accessible places.

In practice, this means travelling around the backwoods of America making speeches designed to flush out recalcitrant managements, which are numerous. One favourite backwater, for instance, is Flemington, New Jersey, a mere 50 miles from New York, but peculiarly inconvenient to get to—it is patronised by Exxon and Eastman Kodak. Coca-Cola, and a host of others, prefer the scenery in Wilmington, Delaware.

Such attempts—as the Gilberts see it—to evade the participation of the shareholders, do nothing to deter Louis D. Gilbert, who searches out the most obscure hidey-holes and can make up to half a dozen speeches without once letting a trace of humour divert him from his like.

"We are like ombudsmen," he tells me from his office on Park Avenue, New York. "We are doing what the unit trusts should be doing and don't. No, no, we are delighted to be called gafflies. Socrates was described as a gaffly. We like the word." There are, he says, about a dozen full-time gafflies in the U.S.

Light relief

It might sound like an ominous hiss in the background, the company which opportunistically started making gas lamps during the 1974 three-day week is continuing to prosper. Having cornered the nostalgia market (principally pubs, but also some streetlighting and historic buildings) Sugg Gas Lighting Equipment of Crawley is once more emphasising the practicality of gas.

It is, for instance, having talks with the authorities in Barbados about tapping local gas discoveries for lighting, and more surprisingly sold £3,000 worth of lamps to New Zealand Railways for use on trains. Inquiries from householders are beginning to come in again too. I gather, despite the cost of converting from electricity, "It may be remembered," said a spokesman wryly, "that in times gone by, one third of the heating would often be derived from the lighting."

Solar energy may be moving rather sluggishly towards solving the world's energy woes—but a Hollywood, California, company is cashing in at a modest commercial level. William Lamb and Earl Turner, proprietors of the Solar Music Co., are selling musical boxes driven by sunshine.

They have set a silicon cell into the top of a clear plastic box containing a tiny electrically-driven music-maker. Given continuous sun—and even slightly overcast skies—solar music pours forth all day. What about the tunes? Lamb and Turner have picked "Beautiful dreamer," "It's a small world," and, of course, "You are my sunshine."

There are some consolations in the British climate, it seems. Somerset Maugham, who once wrote that Raffles in Singapore "stands for all the fables of the exotic East," would be disheartened to learn that the elegant old hotel is soon to be dwarfed by a massive development project. It includes a 66-storey hotel and a 42-storey office block, Raffles City, dubbed a city-within-a-city, will sit largely on the former site of Singapore's oldest school,

Advertisement for RNIB (Royal National Institute for the Blind). It features a photograph of a woman and the text: "My secretary is blind. I'd be lost without her." Below the photo, it says: "Sandy takes down her boss's dictation accurately, then types it out from her braille shorthand. Good speed, good page layout. Sandy says there's nothing special about that—and she's right. The fact that she's blind makes very little difference to her efficiency. Sandy got her job on ability. And her ability won her promotion to personal secretary in an important Post Office department. That's the point. The RNIB trained Sandy at its Commercial College, and any firm that employs a qualified blind person will benefit from the demanding and professional training that we at the RNIB provide. If you happen to be an employer, think it over. We'll be pleased to hear from you. Over and above that, the RNIB needs your help, through legacies and donations, to enable us to train others like Sandy." At the bottom, it says: "RNIB ROYAL NATIONAL INSTITUTE FOR THE BLIND 224 GREAT PORTLAND STREET, LONDON W1N 6AA Under the Finance Act 1975, bequests to charities up to a total of £100,000 are exempt from Capital Transfer Tax. Registered in accordance with the National Assistance Act 1948." The Observer logo is at the bottom right.

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*Jeffie Pitts*

# FINANCIAL TIMES SURVEY

# Aerospace

The world's aerospace industries go to this week's Paris International Air Show at Le Bourget on a buoyant tide of civil and military business that is expected to add more than £300bn to order books during the next decade.

## Expansion ahead despite problems

By Michael Dome

Aerospace Correspondent

EVERY AERONAUTICAL market throughout the world is now expanding. In civil aviation, the growing demand for air travel, stimulated both by cheaper fares in many areas and increasing recognition in developing countries of the way in which aviation can promote economic growth is already resulting in an average annual rise of about 8 per cent in the number of passengers carried. This, in turn, coupled with the need to replace ageing fleets and to meet increasingly stringent Governmental noise regulations and soaring fuel bills, is resulting in a massive inflow of orders for new airliners—a "re-equipment tide" that began to flow early last year but which has quickened significantly in 1979 and is expected to continue until at least 1981. These developments are further spurring other expansionist trends—in the provision of new airports and all the asso-

ciated ground systems that civil aviation requires. The safety checks on the world's fleet of DC-10 jet airliners over the past week have been precautionary, following the crash in Chicago on May 25 of an American Airlines' aircraft. Although causing temporary disruption to some airline schedules, it is not expected that the DC-10's recent problems will affect this long-term re-equipment tide in civil aviation.

A recent detailed study prepared for the International Civil Aviation Organisation (ICAO), the aviation technical agency of the UN by the U.S. firm of T. M. Abrams and Associates suggests that the total value of world civil aviation business through the period from 1979 to 1988 will amount to about \$473bn, about £230bn.

This sum includes spending on new front-line transport aircraft of about £36bn, which is more conservative than some manufacturers' estimates, which put it at over £40bn for some 3,500 airliners of all kinds. But the ICAO study goes on to suggest that other areas of spending will include some \$14.8bn on new "general aviation" aircraft, for the leisure, sporting, agricultural and business flying markets; \$44bn on maintenance and parts for the scheduled airline industry; some \$89bn on fuel; more than \$6bn on new airport construction (again to some minds a particularly conservative figure); nearly \$6bn on air traffic control systems; about \$2.4bn on ground handling systems; about \$70m on government- and airline-sponsored training programmes; nearly

	N. America	Lat-Am./Carib.	Europe	Mid. East	Africa	Asia/Pac	Total
New Airline Transport Aircraft (units)	1,200	200	650	100	100	900	2,750
Percentage of Regional Share	43.7	7.3	23.8	3.6	3.6	18.2	100.0
New Airline Transport Aircraft Value	36,800	3,700	18,300	2,200	1,500	11,000	73,300
Percentage of Regional Share	50.0	5.0	25.0	3.0	2.0	15.0	100.0
Airline Maintenance/Parts Value	47,584	3,660	24,707	1,830	915	12,511	91,597
Percentage of Regional Share	52.0	4.0	27.0	2.0	1.0	14.0	100.0
Airline Fuel Value	93,338	7,321	51,244	2,745	1,830	26,537	183,015
Percentage of Regional Share	51.0	4.0	28.0	1.5	1.0	14.5	100.0
Airport Construction/Maintenance Value	6,324	677	2,444	493	1,869	724	12,531
Percentage of Regional Share	50.5	5.4	19.5	3.9	14.9	5.8	100.0
Airport Traffic Control Systems Value	5,699	806	2,873	460	719	956	11,513
Percentage of Regional Share	49.5	7.0	25.0	4.0	6.2	8.3	100.0
Airport Ground Handling Systems Value	2,567	207	1,348	125	289	278	4,815
Percentage of Regional Share	52.3	4.3	28.0	2.6	6.0	5.8	100.0
Government/Carrier Training Programmes Value	570	184	242	120	234	97	1,447
Percentage of Regional Share	39.4	12.7	16.7	8.3	16.2	6.7	100.0
New General Aviation Aircraft (units)	209,150	18,880	34,860	4,360	3,720	14,520	290,490
Percentage of Regional Share	72.0	6.5	12.0	1.5	3.0	5.0	100.0
New General Aviation Aircraft Value	21,424	2,143	3,367	612	1,224	1,836	30,606
Percentage of Regional Share	70.0	7.0	11.0	2.0	4.0	6.0	100.0
General Aviation Maintenance/Parts Value	13,178	1,007	2,250	275	640	950	18,300
Percentage of Regional Share	72.0	5.5	12.3	1.5	3.5	5.2	100.0
General Aviation Fuel Value	31,729	3,613	5,558	463	2,409	2,548	46,320
Percentage of Regional Share	68.5	7.8	12.0	1.0	5.2	5.5	100.0
Total Estimated Market Value (U.S.\$)	259,013	23,318	112,333	9,323	11,629	57,738	473,354
Percentage of Regional Share of Total	54.7	4.9	23.7	2.0	2.5	12.2	100.0

Source: International Civil Aviation Organisation.

\$9bn on "general aviation parts and maintenance"; and about \$22.5bn on "general aviation" fuel.

The ICAO study suggests that the biggest single share of this outlay will be in North America, still the most active transport region of the world, accounting for 54.7 per cent of the total, with 12.2 per cent being spent in the Pacific/Asia region, 23.7 per cent in Western

Europe, 4.9 per cent in Latin America and the Caribbean, 2.5 per cent in Africa and 2 per cent in the Middle East.

As with civil aviation, the military aircraft markets are likely to continue strong through the 1980s, notwithstanding difficulties in some countries which have already resulted in some cancelled orders, and political uncertainties in others. Estimates of future military

business are more difficult to come by than in the civil arena, partly because of the sensitivities of the military market-place, and partly because of uncertainties over such developments as Strategic Arms Limitation (SALT), Mutual and Balanced Force Reductions (MBFR) and Comprehensive Nuclear Test Ban Treaties.

But the general belief among military aircraft manufacturers

is that despite the shocks earlier this year over the cancellation of substantial Iranian orders for aircraft and missiles, and the loss of Egyptian orders for missiles, helicopters and other aircraft, there will be a heavy continued build-up of conventional military forces worldwide through the 1980s, stemming substantially from the West's response to the continued build-up of the Soviet

Union's and Warsaw Pact's own conventional forces.

In terms of military aircraft, the best estimate is that business worth over \$50bn for upwards of 5,000 new combat aircraft of all kinds is likely to be generated. Associated with this will be a continued strong sale of guided weapons and military avionics (airborne electronics), perhaps amounting to one-third to one-half as much again. On that basis, a military aircraft and weapons market of around \$75bn does not seem unrealistic through to the end of the 1980s.

Just a bare handful of programmes will be contributing substantially to this. The Anglo-West German-Italian Tornado programme alone, for example, is expected to cost about \$8bn for 809 aircraft through the 1980s, while other new programmes for aircraft such as the Jaguar-Harrier replacement could cost just as much. In the U.S., there are several new tactical aircraft programmes planned, including a new trainer for the U.S. Navy, which could run up to 1,000 aircraft or so, and a new Enhanced Tactical Fighter (ETF) to replace several existing ageing types, including the F-111.

If this military potential is added to that of the civil aviation side of the aerospace industry, an overall volume of business through the 1980s of over \$300bn does not seem unrealistic. It could amount to a much more, if other areas of activity are included, such as the burgeoning civil helicopter market and the increasing emphasis on space activities, especially the growth in the development of unmanned near-Earth orbiting satellites for direct applications of all kinds—weather forecasting, telecommunications, environmental control and earth-resources monitoring.

## Spectrum

This business, of course, will be spread over a wide spectrum of other industries closely associated with aerospace—metallurgy, electronics, hydraulics, ceramics, glass, furnishing, civil engineering construction, architecture, and even consultancy work. But the figures, although only broad estimates, serve to show how aviation in all its forms has developed over the past thirty years, until today it is deeply enmeshed in the social and economic life of many countries, not as a luxury, but as an essential tool for progress.

But behind these potentially booming order books, there are problems. The rising cost of fuel is now a constant source of concern to airline managements. While it is not likely to affect the current re-equipment tide for new airlines—because of the sheer necessity to get rid of ageing, noisy and fuel-inefficient aircraft in favour of new ones that are quieter and burn up to 25-30 per cent less fuel per flight—it might force some constraints on airline expansion, especially through increases in air fares, with consequent effects upon revenues and profits in the mid to late 1980s. Fares rises

CONTINUED ON NEXT PAGE

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## means business...worldwide

### Helicopters

The Lynx, Gazelle and Puma have been produced in collaboration with Aerospatiale of France. This successful association, which has led to orders for over 1,800 helicopters, is to continue. New developments include the Westland 'WG 30' medium transport helicopter and 'Wideye', the unmanned remotely-piloted reconnaissance helicopter. For the future there is the continued development of Lynx and Puma as well as the new Westland 'WG 34' helicopter to replace the Sea King worldwide.

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Normalair-Garrett in England, Australia and Singapore is a rapidly expanding company of the Westland Group, supplying hydraulic, pneumatic and electronic systems for advanced aircraft built in Britain, Germany, Italy and the USA. The environmental control system for the new British Aerospace feederliner aircraft BAe146 is designed and manufactured by Normalair, whose life-support experience is also at work in new aerospace, defence and deep diving developments.

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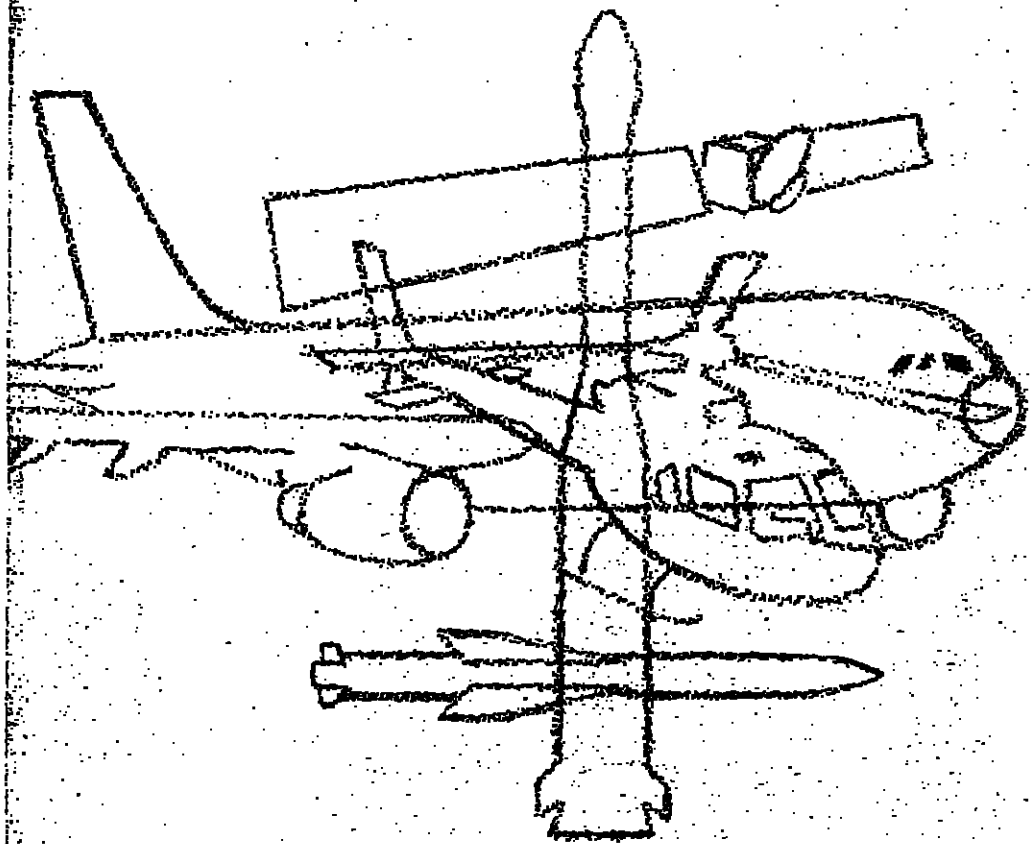
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# Outlook for Britain

## aerospatiale

better aerospace products through mastery of advanced technologies

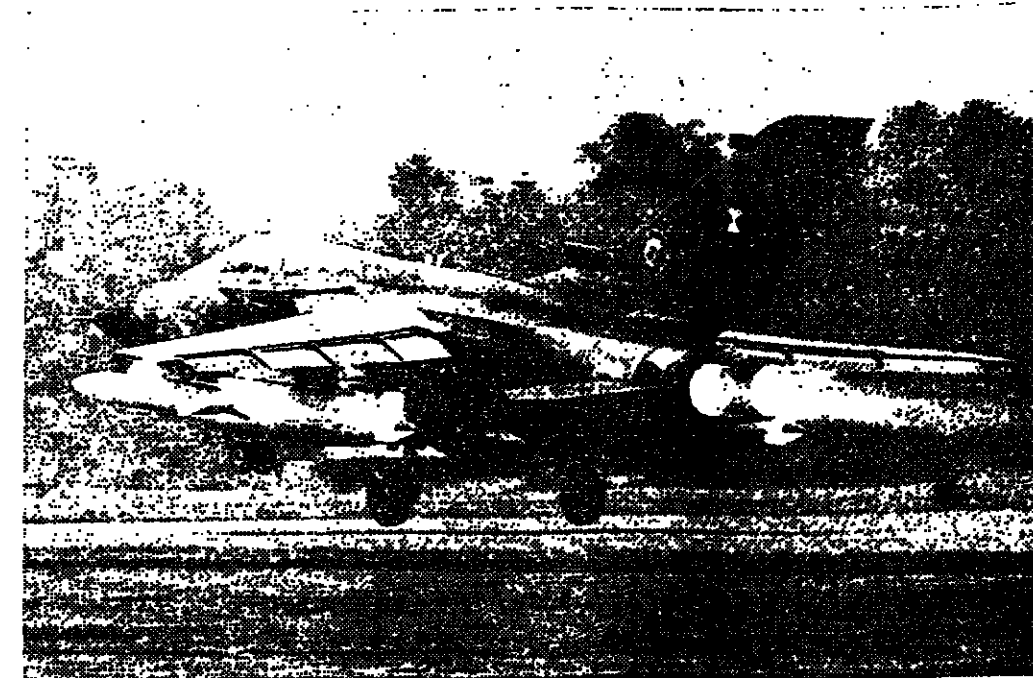


TOTAL SALES by the State-owned sector of the UK aerospace industry last year amounted to more than £1.7bn, with British Aerospace, the nationalised airframe manufacturer, achieving sales of £894m, of which £487m were exports, while Rolls-Royce, the State-owned engine manufacturer, achieved £763m, of which £341m were in exports. Short Brothers and Harland, also owned by the State, achieved sales of over £44m, of which exports accounted for £31m or more than two-thirds of turnover.

One of the major areas of concern over the next few months is likely to be the new Conservative Government's attitude to all these State-owned organisations. It has been indicated that some form of "denationalisation" is likely to be attempted, but in what way is not yet clear—either through partial dismemberment of the groups such as selling off parts of British Aerospace, or offering some of the shares in these ventures to the public. If any changes have to be made (and many doubt the wisdom of this) the latter would clearly be preferred, as being less damaging to the morale and long-term interests of the industry.

For it is pointed out that the aerospace industry in the long term is still likely to need substantial sums of Government support for both new civil and military ventures, and the question is whether any would-be purchaser of any part of the industry would be prepared not only to find the initial purchase price but also the continuing heavy cash investment that would be required. The industry's own clear preference is now to be left alone to get on with the task of building aeroplanes in a period of intensifying world demand, with the minimum of further political interference.

In its first full year as a single trading organisation British Aerospace did well, with trading profits of £79m, or 4.4m above the level of 1977, on sales of £894m, up from £860m in the previous year, of which £487m were in exports. At the end of 1978, the forward order book was close to £3bn, of which 69 per cent was for export. The order book represented a rise of more than £650m over the previous year. The group seems set for a continued period of prosperity, based on the programmes it has in hand in both civil, military



The Anglo-West German-Italian Tornado Multi-Role Combat Aircraft is now in full production, with an ultimate planned total of 809 aircraft. First deliveries are expected to be made next year from what is the biggest individual military aircraft programme to be undertaken in Western Europe since World War II

and guided weapons and space activities, despite setbacks such as the loss of the Iranian order for Tracked Rapier missiles. Major programmes which seem likely to keep it busy include the manufacture of wings for the European A-300 and A-310 Airbus, with an overall design consultancy role on both programmes, following the UK Government's decision to take a full 20 per cent stake in the European Airbus Industrie consortium. On the military side the biggest programme is the Anglo-West German-Italian Tornado Multi-Role Combat Aircraft, of which 809 are being progressively ordered through to the mid-to-late 1980s, at an overall programme cost to the three Governments of more than £8bn.

But there are other major ventures either already under way or in the pipeline. British Aerospace estimates that the total market for civil airliners in which it has some kind of interest (such as the BAe 146 jet feeder-liner, the BAe 748 turbo-prop feeder-liner, the One-Eleven twin-engine jet, the A-300 and A-310 Airbus, and the BAe 125 business jet and Jetstream 31 commuter-liner) could amount to some 5,400 aircraft by 1985, worth about £70bn. BAe will be aiming for a substantial share of this market.

### Major

The A-300 and A-310 are dealt with fully elsewhere in this survey, but with orders and options already for over 340 aircraft, and likely to rise further, it is clear that BAe has a major wing production programme on hand for many years to come.

The BAe 146 is a project for a 70/100-seater feeder liner, which is being offered in both civil and military versions. Expected to cost about £250m to develop, this project is being pressed ahead, despite the lack of firm orders. But Lord Beswick, chairman of British Aerospace, has said that market response so far has been encouraging, and the group hopes to announce orders and options soon. These are unlikely to be big orders in terms of numbers, because the 146 is aimed at smaller operators with limited requirements. Rather, the order book is expected to be made up of a large number of small contracts world-wide. Furthermore, major interest is not expected to materialise until the aircraft has flown in 1980 and can be demonstrated to potential customers.

The first prototype of the improved and re-engineered Jetstream 31 commuter liner is expected to fly towards the end of 1979 from the group's Prestwick factory. Much interest has been shown in this twin-engine aircraft especially in the U.S., where the commuter-liner market is much more highly developed than in the UK and Western Europe, although there could be large markets there, too. In the military field, the Ministry of Defence could be interested in the Jetstream, for it has to replace ageing Pembroke, Dove and Heron aircraft now in service for communications and training and other duties.

The BAe 125 business jet is also a steady seller, with 435 aircraft sold to date, of which over half have been to North American buyers. To maintain the current sales success, BAe is considering a new 125 for the 1980s with new engines (possibly the Rolls-Royce RB-401) and a new, improved wing.

The BAe 748 airliner is now in its 20th year of continuous production, and with more than 300 aircraft already in service, it is thought that further sales of 100 aircraft are likely over the years ahead, at a rate of more than one a month. The aircraft is available in three variants—military, military transport and maritime patrol, with the latter version under study by the French Navy.

Production of the One-Eleven twin-engine airliner continues at a slow rate, but negotiations are continuing with Romania for a co-production contract, on which general agreement has already been reached, involving up to 80 aircraft. This deal should ensure continued production of the One-Eleven through the 1980s, with progressive model improvements, to meet increasingly stringent Government noise regulations, and soaring civil aviation fuel bills.

The remaining major venture for the future is the prospective 130-160 seater and smaller 100-130 seater airliners, for which markets are expected to emerge in the 1980s. So far, it is not clear just what designs will emerge—one, or two—but what is clear is that if they do emerge in Europe, they will have to be internationally collaborative ventures, and this tends to indicate that Airbus Industrie might be the chosen organisation.

Airbus Industrie has conducted a number of studies under the broad title of the

"Joint European Transport" programme, but the competition could be formidable, with the major U.S. manufacturers, and especially Boeing, almost certain to jump into any emerging market they see, with improvements to or derivatives of such models as the Boeing 737, 727 and McDonnell Douglas DC-9. Thus Europe will need to be finely tuned to the market requirements and prepared to move swiftly with a specific design if it is not to be left behind.

There is also the question of whether or not there will ever be a "second generation" supersonic airliner to succeed the Concorde, all of whose 16 authorised production aircraft have now been built and flown. It is unlikely that the UK and French Governments would be prepared to finance such a development on their own, and any new venture would almost certainly have to be tri-national, with the U.S. industry deeply involved.

There have been continuing technological studies of supersonic transport by the U.S. National Aeronautics and Space Administration, and by the individual major U.S. aerospace manufacturers, but so far no firm project has emerged, and there is some doubt as to when, if ever, it will, since currently the manufacturers have their hands full and their finances fully committed on the new generation of subsonic jets. But the pressures are there, and some time in the next few years it seems likely that this question will rise to the surface again, and some tri-national discussions will take place with a view to developing such an aircraft—perhaps fuelled by liquid hydrogen rather than fossil fuels—for the late 1990s or early 2000s.

The Dynamics Group of British Aerospace, which builds guided missiles and spacecraft, had a 1978 turnover of over £270m, and at the end of last year the order book stood at over £1bn, of which just under 50 per cent is for export. The order for the Tracked Rapier for Iran, however, accounted for £270m of this, and this deal has now been terminated, but Dynamics Group is hopeful of filling the gap with other orders from overseas.

The production of the group comprises air-launched missiles (such as the new Sky Flash air-to-air weapon for the Tornado combat aircraft); Army missiles (such as the Rapier light anti-aircraft system, and

the Swingfire anti-tank missile); and Naval missiles (such as the Sea Dart medium-range surface-to-air missile and the Sea Wolf short-range anti-missile missile). New missiles in all these fields are under study for the 1980s.

In space systems, the group is associated with the two major European consortia (MESSE and STAR), building satellites for both scientific research and direct applications. Among projects under study are several for further scientific space work and for the development of space communications through the European Communications Satellite (ECS) and the Maritime Applications Satellite (MARECS), contracts for both of which are under way.

Rolls-Royce, which is wholly owned by the Government through the National Enterprise Board, earned a pre-tax profit of £11.7m last year, down on the previous year's total of £20.5m. Sales amounted to £738m, compared with £704m in 1977.

The company achieved a record volume of new business, signing contracts for engines which would be worth more than £2bn over the years ahead. The RB-311 engine is now the company's biggest single civil engine venture, with orders and options for over 1,200 engines in all versions, of which well over 700 have been delivered. In the civil field, other major engines still selling well include the Dart turbo-prop, the Viper turbo-jet and the Gem helicopter engine.

### Ventures

In the military field, the major programme is the RB-199 engine with Turbo-Union for the Tornado combat aircraft, which is likely to involve a total production of over 2,000 units, but other major engine ventures include the Adour, the powerplant for over 500 military aircraft world-wide, including the RAF Hawk. The Pegasus is in service with the Harrier VTOL fighter and is designated for the U.S. AV-8B Harrier; while the Spey is not only still in service in civil airliners such as the One-Eleven but has also been selected as a military powerplant for the new Italian AEMX close-support aircraft. The Tyne turbo-prop is used for the Italian G-222 military transport.

Short Brothers and Harland, the Belfast aircraft manufacturer which is also now wholly owned by the State, had a buoyant inflow of orders last year, which was also characterised by rising productivity in an atmosphere of good industrial relations, and full Government backing for the company's five-year Corporate Plan.

This provides for continuation of the three main activities of the company—production of its own Skyvan and SD-300 aircraft, aerostructures work for other companies (such as pods for Boeing 747s and Lockheed TriStars), and the design and manufacture of guided weapons. A major objective will be to exploit the potential of the SD-330 Commuter-liner of which 34 have been sold with two more aircraft on option, and also to build up production of the U.S. Piper Tomahawk light aircraft. The UK Government is investing another £60m in the company during the period to 1982, by which date a major programme of capital re-equipment will have been completed. During 1978, substantial new production contracts worth more than £70m were won in the three main areas of activity, especially for the SD-330, and further sales of this aircraft are expected to be announced soon, probably during the forthcoming Paris Air Show.

Michael Donne

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**UNITED TECHNOLOGIES**

## Expansion

CONTINUED FROM PREVIOUS PAGE

already announced this year may not be enough to cope with the rise in fuel bills, and further increases could be announced soon.

It is also becoming clearer that the re-equipment tide now flowing may be the last this century, at least for airlines of the type we have come to know in the past few years. When the next re-equipment tide begins to flow in the mid to late 1990s, for aircraft to serve well into the next millennium, it may well be for airliners of very different shapes, burning different types of fuel—such as liquid hydrogen, or perhaps some kind of fuel derived from coal.

There is now hardly an aerospace manufacturer world-wide, civil or military, who is not in some form or another conducting research already into the possibility of alternative fuels, and more economically efficient aerodynamic shapes, and it is obvious that this area of activity must expand through the 1980s. Civil aviation world-wide still only burns about 4 per cent of the total petroleum-based fuels consumed, and some significant strides have been made in fuel conservation with the new generation of airliners and engines. But, clearly, much more will have to be done.

It seems likely that some of the exhibits at this year's Paris

International Air Show will be devoted substantially to this theme of thinking about tomorrow.

For the immediate future, however, there are some other problems dominating the thoughts of the aerospace industries. In the UK, the long-term plans of the new Conservative Government towards divesting itself of some of its investments in aerospace, which are substantial, are a matter of concern to many in the industry. With the bitterly fought nationalisation of the principal manufacturers (British Aircraft Corporation, Hawker Siddeley Aviation, Hawker Siddeley Dynamics and Scottish Aviation) into British Aerospace now only just settling down, there are many who believe that further political disruption of any kind can only be damaging to morale, and interfere with the industry's main task of building aeroplanes.

### Majority

For while there is undoubtedly much business in aerospace world-wide, the majority of it, especially in civil aviation, is likely to be won within the next two to three years, and it is on the orders secured in that period that much of the industry must live for years thereafter. Anything that diverts the industry's

attention from the immediate task of winning orders for ventures that are new, like the A-310 Airbus, or have yet to get off the ground, such as the BAe 146 four-engine jet feeder-liner, is not likely to be endorsed by the industry's managers and workers.

The world's aerospace industries also face some immediately severe problems in the supply of skilled labour, materials and machine tools. All are in demand in a wide range of advanced technological industries world-wide, and the pressures thus generated are making it difficult for the aerospace industries of Europe and the U.S. to get all they need in all three areas. These shortages are not yet constraining factors in the production of new civil airliners and military aircraft with consequent stretch-outs of delivery dates, but they might well be in the early to mid-1980s.

Similarly, in civil aviation, a shortage of pilots is emerging that could become more severe in the early to mid-1980s, and already moves are being made in some countries, notably the UK, to identify the possible sources of new recruits and to find ways of encouraging them to join the airline industry.

The other possible area of difficulty in the years ahead is that of finance—funding all the developments and the new business that the aerospace indus-

tries can see emerging. On the military side, much of the funding for new developments is likely to continue to come from governments, but sales may well also have to be subsidised by the vendors in some parts of the world, as part of politico-economic aid.

On the civil side, there appears at present to be no shortage of available cash for the airlines to buy the new generation of jet airliners—indeed, banks and even governments appear to be falling over themselves to provide or guarantee long-term loans for airline re-equipment, encouraged no doubt by the confident reports of expansion stemming from the airline and aerospace industries.

But the magnitude of the sums that will be outstanding in the aerospace sector through the decade or so ahead will be such that there will be considerable pressures on the aerospace and airline industries to improve efficiency and to increase productivity. As a result, competition is likely to become fiercer than it already has, for example, between Boeing, hitherto the juggernaut of the world airliner business, and the comparative newcomer, Airbus Industrie in Western Europe. The period ahead is one full of promise, with massive business waiting to be won, but it may well also be a period full of difficulties and even heartbreaks for some.

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AEROSPACE III

# Fierce struggle in engine market

WITH THE world's airlines likely to commit themselves for more than 3,500 airliners worth close to £40bn over the period immediately ahead, the aero-engine manufacturers are involved in just as fierce a struggle as their airframe counterparts to win a share of this business.

The aero-engine element of any new airliner is generally estimated to amount to about a quarter of the basic fly-away value, rising to about a third if initial spares are also included. Over the life of the aircraft, of anything between 15 and 20 years, at least the same value again is likely to be spent on spares, so that the engine makers are bidding for shares of a total market that could amount to anything up to about £25bn to £30bn between now and the early 1990s.

With such a massive market at stake, it is not surprising that the battles are fierce. This is especially so now that the airframe makers are offering their wares with a choice of engines.

Boeing, for example, is offering its 747 jumbo jet with a choice of "big thrust" engines from all three of the major engine companies—the Pratt and Whitney JT-9D, the General Electric CF6 Series and the Rolls-Royce RB-211—all of which are available in a variety of models. The medium to long-range wide-bodied jets, the Lockheed TriStar and McDonnell Douglas DC-10 are also theoretically available with a choice of engines, although so far as the TriStar is concerned the RB-211 is the only choice to date by all customers, while the DC-10 is being offered with either the GE or Pratt and Whitney engines.

In the smaller, short-to-medium range category of new-generation airliners, the field is wide open, and it is here that the fiercest battles are taking place. Boeing, for example, is offering its new 737 airliner with a choice of engines from all three major manufacturers, and its 757 with a choice between the General Electric CF6-32 and the Rolls-Royce Dash 535 version of the RB-211, with the latter so far selected as the "launch

engine" for the 757s ordered by Eastern Air Lines of the U.S. and British Airways.

It is vital that Rolls-Royce exploits this lead in the 757, for the competition from General Electric is formidable, and growing. The latter company has signed agreements with Voivro Flymotor in Sweden, Snecma of France and Alfa Romeo of Italy to help it to develop the CF6-32 for this class of airliner, and some airlines interested in the 757 are known to be thinking also in terms of the GE engine against the RB-211-535. The opportunity offered to Rolls-Royce is unlikely to recur, and if the Dash 535 should fail for any reason—either on price, delivery dates or performance—there is a powerful competitor waiting in the wings to move in and capture what could be one of the biggest engine markets of all time.

Rolls-Royce, however, is well aware of this, and is pushing the 535 hard, making it plain to its labour force that the current opportunity could, if exploited, bring the company many years of business, estimated to be worth up to £5bn between now and the rest of this century. A development batch of ten Dash 535C engines is being built, six of which will be on test before the end of 1979. Certification of the engines is set before mid-1981. Deliveries of production engines to Boeing begin in 1981, and the engine will enter service in early 1983.

**Battle**

With the 250-seat wide-bodied, twin-engine European A-300 Airbus, and the smaller 200-seat A-310 version of that aircraft, the engine battle is between General Electric, with its CF6-50 series of engines, and Pratt and Whitney with its JT-9D. In recent weeks, various airlines have selected one or another of these engines, but so far Rolls-Royce is not in this fight.

This is regarded by many in the world airline business as a mistake on the UK company's part, for it is now quite clear

that there are going to be many more sales of the A-300 and A-310 world-wide in the years ahead, and that if Rolls-Royce does not move soon to get its RB-211 engine onto either aircraft, even in anticipation of orders, spending its own money to cover the costs of certification, it could lose a substantial slice of the world engine market.

For while to get the RB-211 certificated on the Airbus would cost a substantial sum, say about £25m, and that this should be justified by orders, it is also a fact that those orders are less likely to emerge if the RB-211 is not seen to be clearly available and ready—especially now that British Aerospace itself has a 20 per cent stake on the aircraft, building the wings for both the A-300 and A-310.

In the meantime, the two other big engine builders, General Electric and Pratt and Whitney, continue to capture the market in the Airbus. In the first three months of this year, Pratt and Whitney, the biggest jet engine builder in the world, has won new engine business worth well over \$300m, more than double the business it logged in the comparable period of 1978, with its JT-9D engines being selected in various versions for Boeing 747s, McDonnell Douglas DC-10s, Airbus Industrie A-310s and A-300s, and its JT-8D engines being selected for more Boeing 727s and 737s, and McDonnell Douglas DC-9s.

One feature of the aero-engine battle now emerging strongly is the growth of the "re-engineing" market, whereby existing ageing DC-8 jets are to be fitted with the new-generation CFM-56 engine, built by CFM International, the Franco-U.S. (Snecma-General Electric) consortium. This 22,000 lbs-plus engine has been selected by United, Delta and Flying Tiger for many of the DC-8s in their fleets, and it is likely soon that some airlines with ageing Boeing 707s will also decide in favour of re-engineing them with CFM-56s.

It is estimated, for example, that there are 240 DC-8 Series 60 aircraft in service, most of which could be re-engined with

the CFM-56, yielding a market for over 1,250 engines over the next ten years, including spares. In addition, there are some 500-plus Boeing 707s, 737s and military KC-135 tankers that could also use the CFM-56 engine. The total business, therefore, could run to as many as 3,000 engines, worth well over \$6bn. The importance of this business to the Franco-U.S. aerospace industry can be seen from the fact that the sale of seven CFM-56 engines and spares is equal to that of one Airbus.

Behind these battles for new engines in the short-to-medium range and long-range jets for the 1980s and beyond, there is likely to emerge another major demand for engines in what is generally called the "Spey replacement" class—that is, for engines of 16,000lbs thrust and above. It is agreed that sooner or later a market is likely to emerge for a new aircraft in the 100-130 seat category for short-range duties, that will require a new-technology engine sufficiently quiet and fuel-efficient for use throughout the rest of this century and into the next.

**Bracket**

Such an aircraft could be the projected Fokker Super F-28 (F-29), or a British Aerospace One-Eleven replacement, or something new from Airbus Industrie in Europe in its "Joint European Transport" programme, while Boeing of the U.S. is also looking at possible developments of its own 737 short-range jet airliner and McDonnell Douglas is looking at further derivatives of the DC-9. But whatever this new aeroplane is, and no matter where it comes from, it will need a new engine of somewhere in the 16,000lbs-plus thrust bracket.

Rolls-Royce believes that it has one possible candidate with its RB-432, of 16,000 to 18,000 lb thrust. Pratt and Whitney has been working on derivatives of its JT-8D engine, including the Type 217 of 20,000 lb thrust which is already being offered in new versions of the DC-9 airliner, while the CFM-56 itself is being offered in a "de-rated

version of about 18,000 lb thrust.

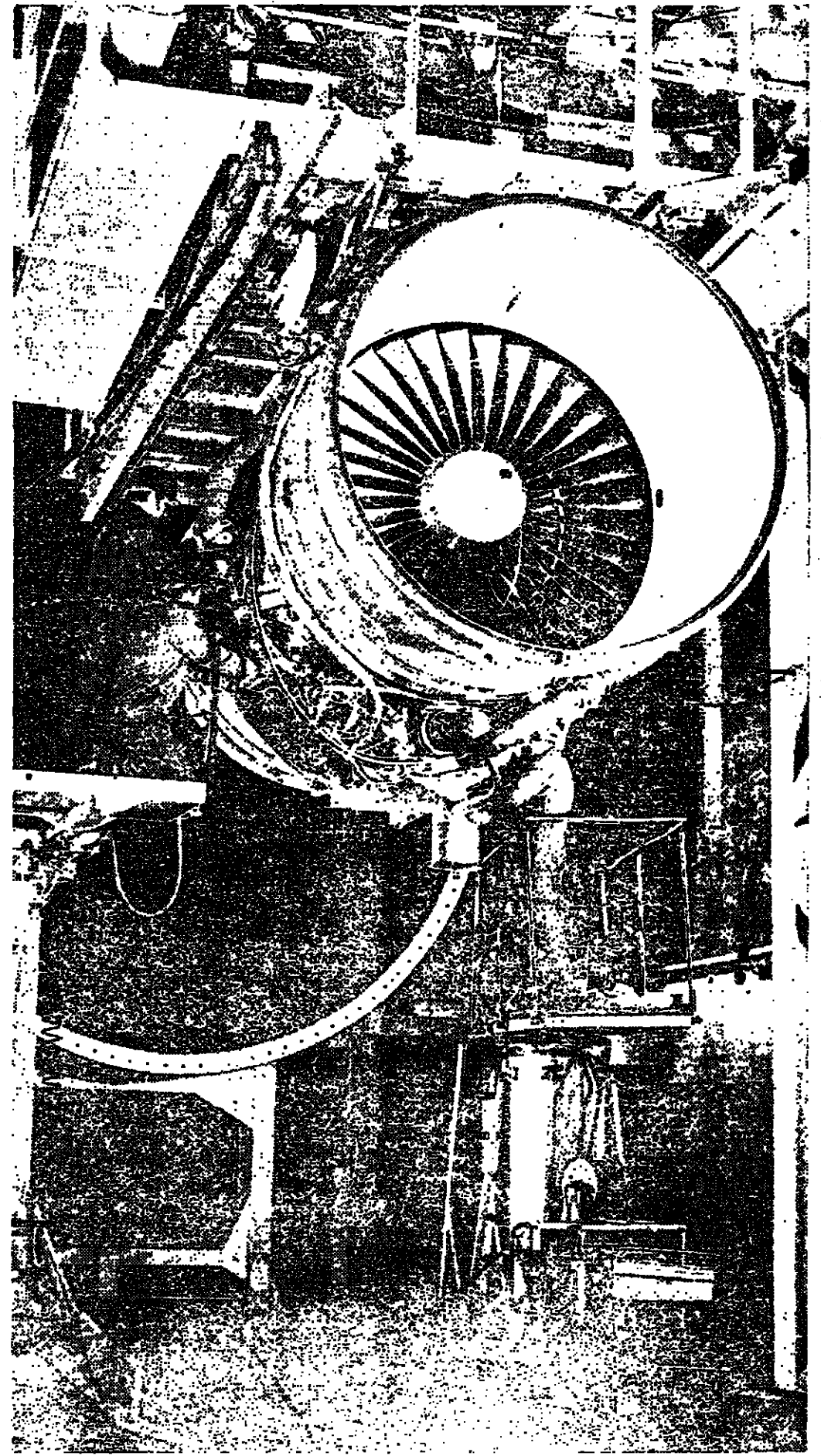
All of these are engine possibilities for a 100-130 new-generation jet airliner, while beyond that the possibility of a bigger 130-160 seater jet has also been widely mooted. This would require a bigger engine, which the CFM-56 in its existing version might well be able to fill, but Rolls-Royce would have to find something between the RB-432 and the Dash 535 version of the RB-211 if it wished to get into this 130-160 seater market.


Below this field again there is another major market emerging, for a new engine for business and executive jet aircraft. Here, as with the bigger aircraft, the need is for increased fuel efficiency and lower noise, and Rolls-Royce has been working on its RB-401, of 5,500 lb thrust, as a possible candidate for this market.

But because Rolls-Royce has heavy commitments on its existing RB-211 programmes, it seems unlikely that the UK Government would agree to help finance further new engine programmes such as the RB-432 and RB-401 in anticipation of orders. Thus, it would appear that it is up to Rolls-Royce itself to ensure that the airframe builders and the airlines and business-aircraft users round the world are aware of its projects and programmes, and to canvass for the commitments that will enable these new engines to be formally launched into full-scale development.

M.D.

The Rolls-Royce RB-211 Dash 535C engine is now under intensive development for the Boeing 757 twin-engine jet airliner, which is due into service early in 1983. The engine will have a thrust of upwards of 32,000 lb. Test running has begun at the Rolls-Royce Derby factory, and six engines will be on test by the end of this year.





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AEROSPACE IV

# Orders roll in for new generation of airliners

DURING THE first half of this year more than 350 new jet airliners of all kinds have been ordered throughout the world. Together with more than 700 new jets ordered worldwide during 1978, this means that well over 1,000 new jets have been earmarked for the world's commercial airline fleets for the 1980s and beyond worth collectively more than \$25bn (over £12bn).

Thus, the long-awaited "re-equipment tide" is now clearly flowing strongly, both to replace existing ageing and increasingly noisy and fuel-thirsty fleets, and also to provide additional capacity to meet the anticipated expansion in world air passenger and cargo traffic in the years ahead.

Boeing of the U.S., the world's biggest commercial jet builder, has estimated that there will be a requirement for more than 3,500 new jets, worth some \$79bn (nearly £40bn) between now and 1988, of which about 30 per cent will be to replace existing fleets, and 70 per cent to meet traffic growth.

Of this market, Boeing believes that the short-range requirement will amount to some \$17bn, the medium-range market for some \$29bn, and the long-range market for about \$33bn, with all-cargo aircraft accounting for about \$3bn.

As to geographical distribution about 43 per cent of all spending by the airlines will be in the U.S., about 28 per cent by airlines in Europe, and some 29 per cent in the rest of the world.

Boeing further analyses the market by demand for various sizes of aircraft. In the vast short-to-medium range market (that is, up to 2,700 statute miles), it believes there will be the biggest demand, for some 46 per cent of all aircraft purchases, for "small" aircraft seating up to 160 each. This presages a continued steady demand for Boeing's own existing 130-seat 737 twin-engine short-range jet, and its 150-seat 727 three-engine medium-range jet.

For the "medium size" of aircraft, of between about 150 and 250 seats, it foresees some 25 per cent of the market—an area that will include not only its own new 177-seat 757 and 200-seat 767 twin-engine air-

liners, but also their rivals from the European Airbus Industrie consortium, the 250-seat A-300 and the smaller 200-seat A-310.

In what it calls the "large" size of short-to-medium range airliners, seating over 250 seats each, there will be a demand accounting for some 6 per cent of the overall market.

The rest of the deliveries between now and 1988 will go to the long-range sector of the market—that is, for airliners capable of more than 2,700 statute miles. Here, Boeing believes that some 18 per cent will go to the bigger aircraft, seating more than 250 passengers at a time—its own 747 Jumbo jet, the McDonnell Douglas DC-10 and the Lockheed L-1011 TriStar in their various versions. A much smaller share of the market—about 5 per cent—will go to the medium-sized long-range jets, seating between 160-250 seats.

## Sustained

When measured against the Boeing predictions, it can be seen that the orders placed over the past 18 months, more than 1,000 aircraft, amount to close to one-third of the anticipated total during the current period of fleet re-equipment. The sustained rate at which the world's airlines have been buying over the past year and a half is such that the bulk of the re-equipment needs of the biggest airlines will have been settled by about 1981-82, and that thereafter demand is likely to slacken.

Thus, the orders which the major manufacturers can win between now and 1981-82 seem likely to be those they will have to live on through the rest of the 1980s, topped up with the smaller volume of demand from airlines moving up in the league table and requiring more modern equipment. The manufacturers who fail to win a sizeable share of the re-equipment cake over the next two to three years are not going to have much left to sustain them through the rest of the 1980s.

This largely explains why the battles now under way in the airline Boardrooms are so fierce, matched only by those seen at the very beginning of the jet era in the mid to late 1950s.

As might have been expected, the battles are fiercest in the big short-to-medium range market. This is where the rewards are greatest, and where the manufacturers have concentrated most of their hopes—on the existing Boeing 737 and 727 jets, the new 757 and 767, the European A-300 and A-310A, and the McDonnell Douglas DC-9.

In the larger medium and long-range areas, the battles are less fierce, but none the less significant, dominated by the three big "wide-bodies"—the Boeing 747 Jumbo, the McDonnell Douglas DC-10 and the Lockheed L-1011 TriStar, all of which are being offered in a variety of models.

In this medium to long-range market, Boeing already has orders for close to 500 Jumbo jets, and hopes to reach 1,000 aircraft by 1990. So far, Lockheed has sold 284 aircraft, including options or "second buys," while McDonnell Douglas has sold over 400 DC-10s.

But it is in the big short-to-medium range market that the battle is fiercest. The most dramatic development in recent months has been the upsurge in orders for the European Airbus, both in its 250-seat A-300 and smaller, 200-seat A-310 versions, where total orders and options now stand at 346 aircraft from 29 customers, of which 239 are for the A-300 (167 firm and 72 options), and 107 are for A-310s (52 firm and 55 options). Airbus Industrie is now, in fact, Boeing's most formidable competitor, for the latter's new "semi-wide-bodied" 767 and its narrow-bodied 757 are the direct competitors for the A-300 and A-310 respectively.

So far, the battle appears to have gone largely Airbus Industrie's way, especially in Europe and large parts of Asia. Apart from British Airways, which has ordered 19 757s, no one outside North America has yet ordered either 767s or 757s.

At the same time, however, apart from an early order from Eastern Air Lines of the U.S. for the A-300, with options on the A-310, no one in the U.S. has ordered either of the European jets.

The battle between Boeing and Airbus Industrie, therefore, seems to be wide open, Boeing's

total orders for its new jets amount to 229 aircraft (84 767s with options on another 31, and 40 757s with options on another 24).

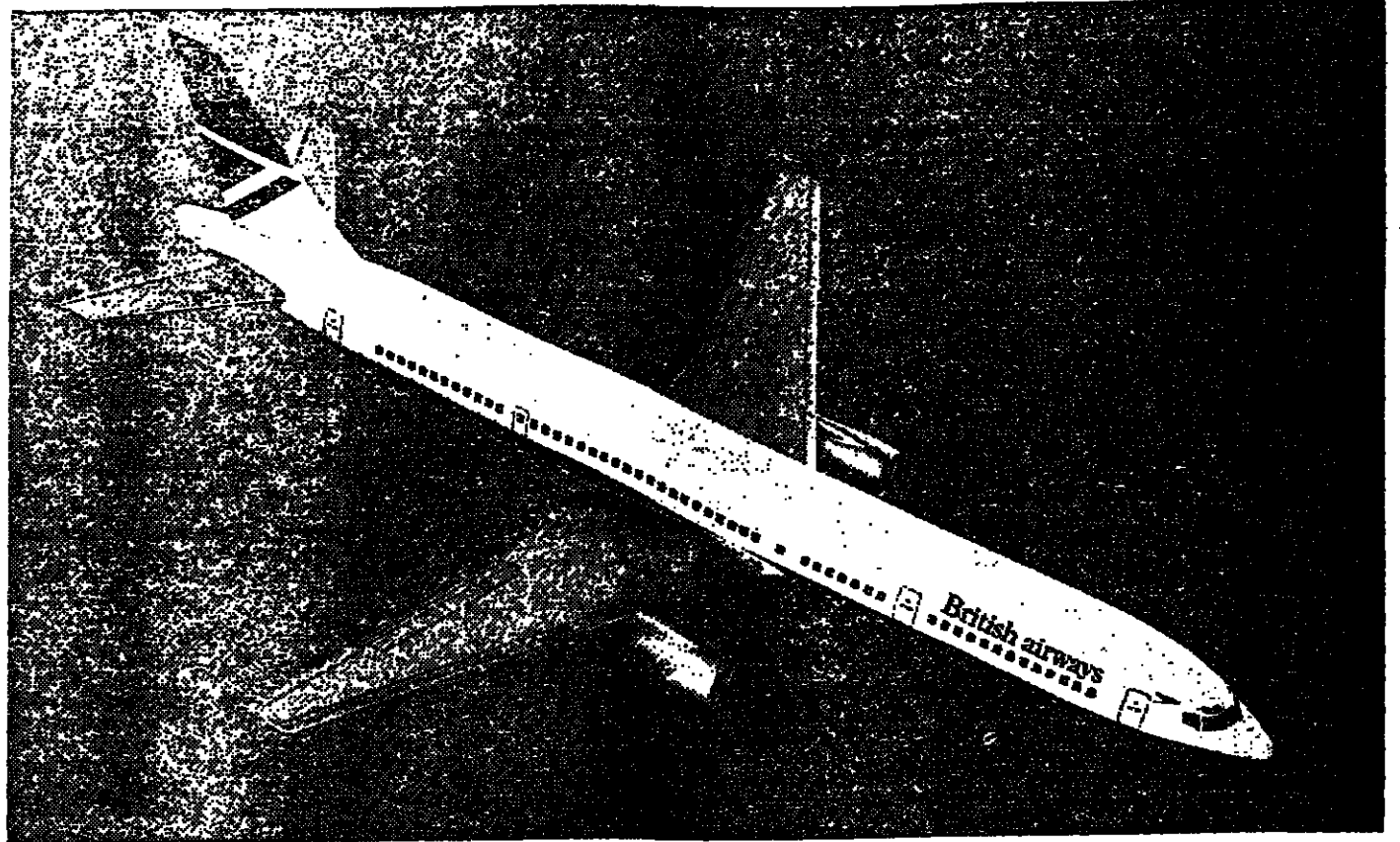
## Target

Airbus Industrie's own sales target is a minimum of 1,000 aircraft by 1990, which compares with its break-even figure on the A-300 of between 350 and 400 aircraft. It believes this target to be realistic, especially since its existing customers will all buy further aircraft in the years ahead to raise their cumulative fleet to well over 500 aircraft. To meet anticipated demand, Airbus Industrie (in which British Aerospace now has a 20 per cent stake, building the wings for the A-300s and now also the A-310s, and with an overall design consultancy role in the Airbus programme) plans to raise its production from the present two aircraft a month to three a month by October, and further to four a month in 1980.

As the new A-310 moves in alongside the A-300, combined production will rise further to six aircraft a month by mid-1982, and then to eight a month by 1983-84. It is planned to raise this yet again to ten aircraft a month as demand justifies.

Boeing's long-term market forecasts indicate that it will sell up to as many as 2,000 aircraft by the early 1990s, combining 767s and 757s. It remains calm in the face of the Airbus Industrie onslaught, although undeniably the latter has won contracts Boeing had hoped to capture for one or another of its aircraft. But it still believes it will capture the lion's share of the U.S. market, and points to the fact that there are still many airlines throughout the world who have not yet made up their minds on what to buy for the future, and who will have to decide soon. Meantime, it continues production of its existing jet airliners—the 737 short-range jet, the 727 medium-range jet and the long-range 747 Jumbo—and this year is raising total production of these from 24 to 28 aircraft a month, a rate it expects to maintain at least through to 1981 on the basis of existing orders, proposals and options.

Boeing has a third new air-



The Boeing 757 twin-engine jet airliner, which uses the Rolls-Royce RB-211-535C engines, in the colours of British Airways, which has ordered 19 of the aircraft

liner programme, the medium-to-long range version of the 767, called the 777, a three-engine aircraft capable of carrying up to 220 passengers over 5,000 miles. But although a considerable amount of design work has been done on this (it could also use the Rolls-Royce RB-211 Dash 335 engine), no formal decision to launch it has yet been taken. Boeing is waiting for a launching customer among the major U.S. domestic airlines, but so far none have shown themselves anxious to pick up the programme. Boeing, however, refuses claims that the 777 represents a "re-invention" of the basic existing tri-jet programmes, the Lockheed TriStar and McDonnell Douglas DC-10, and claims that the 777 would be much more flexible in performance.

In the meantime, both Lockheed and McDonnell Douglas are pressing on with their own programmes, both with long-haul versions of their tri-jets, the Dash 500 TriStar and "stretched" DC-10, and McDonnell Douglas is also in the market with the latest version of the DC-9, the Super 80, which is selling well despite formidable competition.

Another significant development in this battle for new generation airliners has been the decision by some U.S. airlines (United, Delta and Flying Tiger) and others to re-engine some of their older long-range McDonnell Douglas DC-8s with the new Franco-U.S. (Sneema General Electric) CFM-56 engine, built by CFM-International. This engine, of 22,000 lb thrust and upwards, burns up to 22 per cent less fuel than the existing engines in the DC-8s, and will give more range and less noise also.

Thus a substantial market could be opening in the re-engineing business. In order not

to be left behind, Boeing has revived interest in its own original plan to re-engine the ageing 707 with the CFM-56, and it seems that several hundred old long-range aircraft could at least get a few years' more life from this re-engineing scheme, although eventually the DC-8 airframes must run out life and lead to them being phased out in the later 1980s or early 1990s.

With all these new jets on offer, it might be supposed there was little real scope for anything more. But, in fact, many in the aviation business believe that there is a market waiting for a new, quiet, fuel-efficient jet airliner of between 130 and 170 seats—perhaps even two models of between 100 and 130 seats, and from 130 to 180 seats or so. All the major manufacturers have looked at this market, with Airbus Industrie and Boeing again apparently the most interested (although McDonnell

M.D.

## 44 chairs...no waiting.

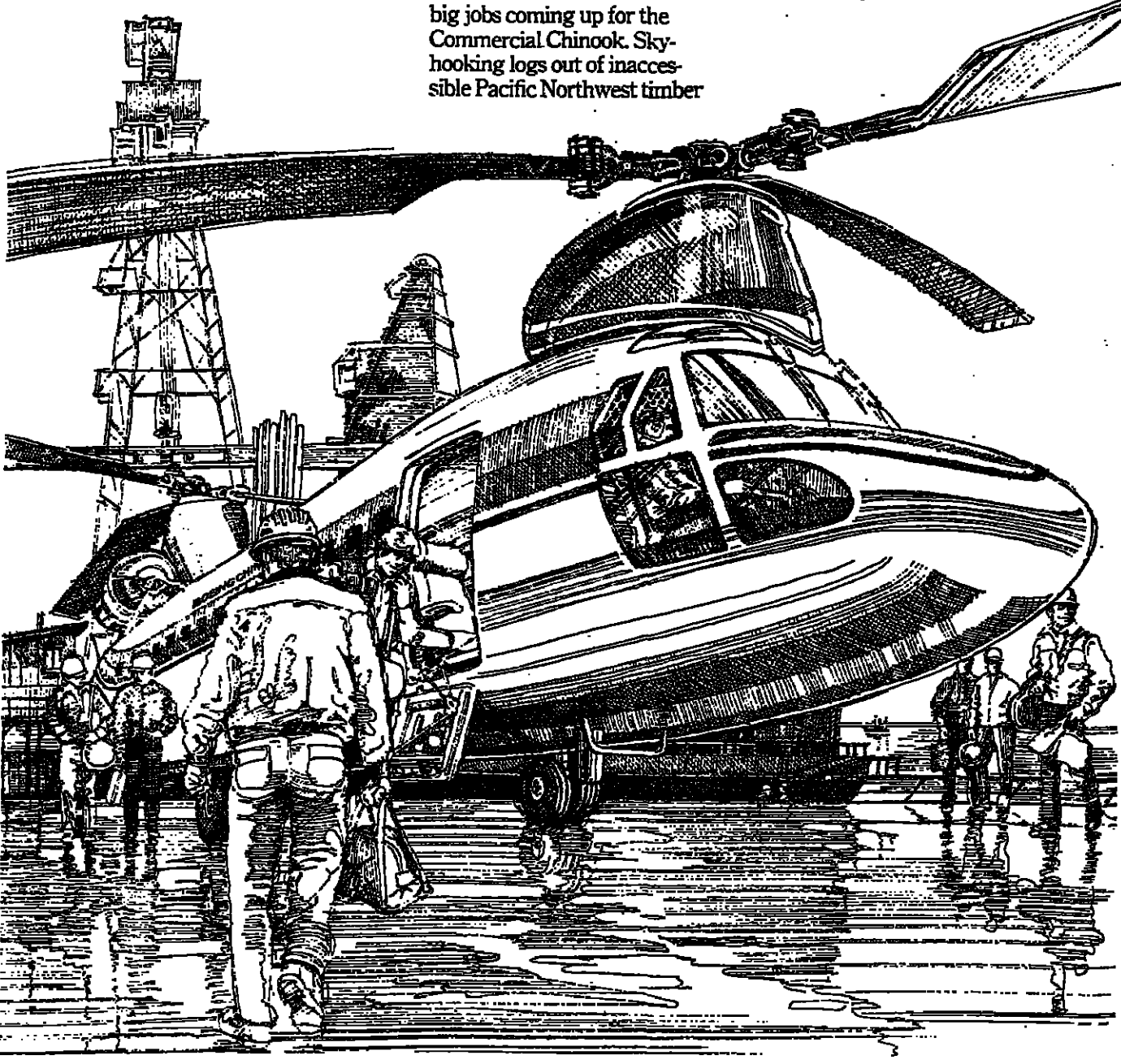
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There are a lot more big jobs coming up for the Commercial Chinook. Skyhooking logs out of inaccessible Pacific Northwest timber

stands. Placing giant power transmission towers on site. Carrying men and machinery to remote development areas. Wherever time, distance, and capacity can slow the work, the Chinook ends the waiting. For literature, write Merv Cromie, Director, International and Commercial Sales.

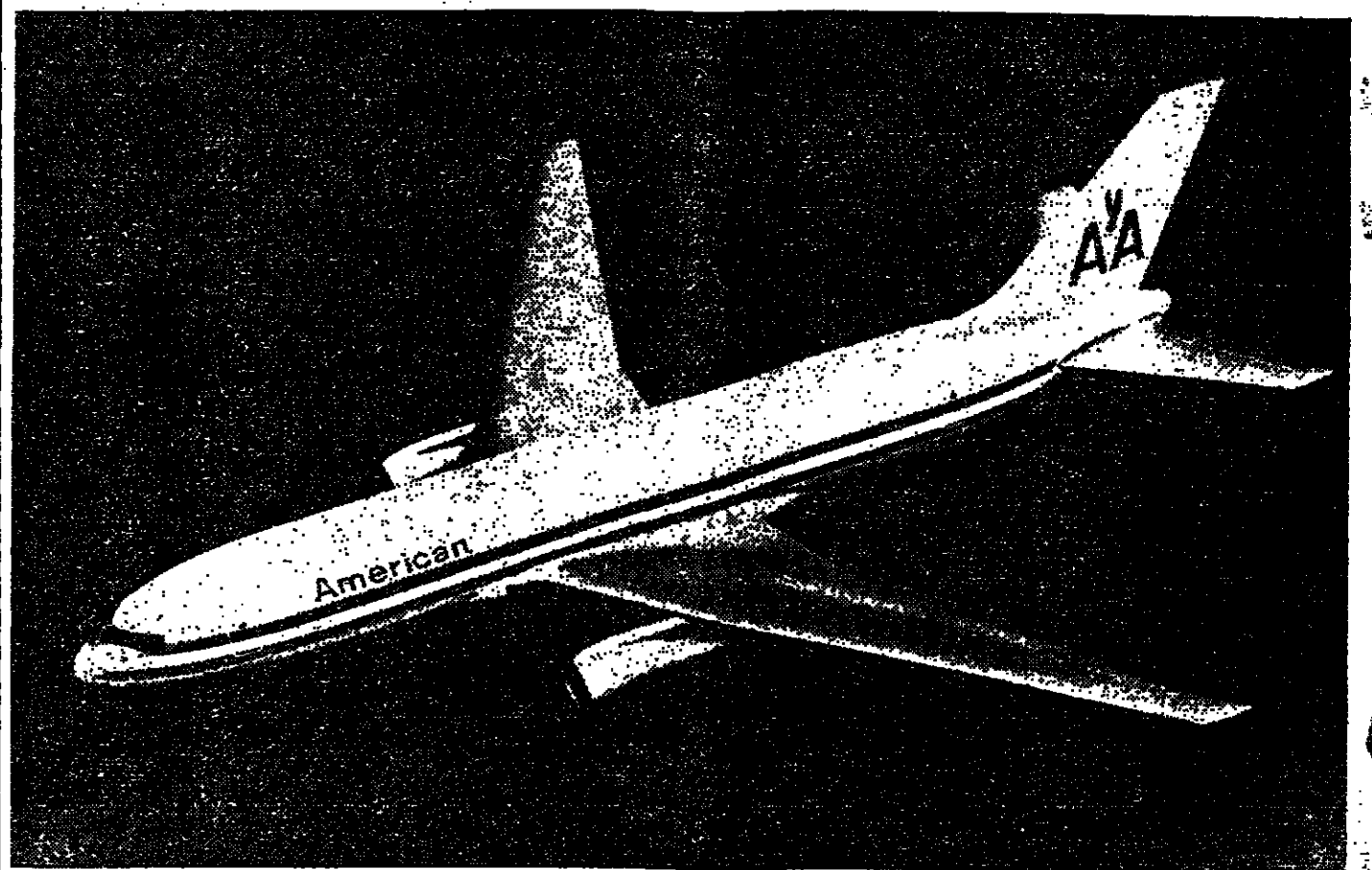
**BOEING VERTICAL**  
**HELICOPTERS**  
**THE LEADING EDGE**  
Philadelphia, Pa. 19142



COMMERCIAL AIR TRANSPORT					
(Est. m)					
	Passenger volume	Passenger-km	Freight tonne-km	Total tonne-km	Operating revenue
% average annual growth 1968-77	+6.9	+8.1	+9.8	+8.6	+13.5
ICAO estimated volume 1977	314	686,000	21,000	85,340	U.S.\$ 49,000
Estimated world volume 1978	550	743,000	22,060	93,030	U.S.\$ 55,120
% difference	+7.0	+8.3	+9.8	+9.0	+12.5
% average annual growth est. 1979-88	+7.2	+8.5	+10.0	+9.0	+12.0
Estimated volume 1988	945	1,680,000	44,120	176,760	U.S.\$ 121,270
Accumulated volume 1979-88	7,668	11,960,000	341,900	1,390,800	U.S.\$ 915,070

TOTAL 1979-88 VOLUME BY REGIONAL CARRIERS							
(Est. m)							
	North America	Latin Amer./Caribbean	Europe	Mid-East	Africa	Asia/Pacific	Total
Total passengers	3,011	406	1,802	230	169	1,150	7,668
% share	51.0	5.3	28.5	3.0	2.2	15.0	100.0
Total tonne-kilometres	688,446	69,540	354,654	45,896	30,598	201,666	1,390,800
% share	49.5	5.0	25.5	3.3	2.2	14.5	100.0
Total operating revenue (U.S.\$)	388,995	32,027	297,398	32,028	27,452	137,260	915,070
% share	42.5	3.5	32.5	3.5	3.0	15.0	100.0

Source: International Civil Aviation Organisation.



The Boeing 767 twin-engine "semi-wide-bodied" jet airliner, which has been ordered by several major U.S. airlines including American, Delta and United. It is one of two "new generation" jet airliners now under development by Boeing, the other being the 757 narrow-bodied jet, which uses the Rolls-Royce RB-211-535C engines

*Jelly isolated*



# Helicopters heading for major growth phase

THE DEVELOPMENT of the helicopter, technologically over the past few years has been exceptionally rapid. Whereas at one time it was a comparatively expensive type of aircraft, which only the military could afford, and with limited payload-range performance, it has now evolved into an increasingly acceptable vehicle, economically as well as technically, and it is able to compete vigorously with the economics of the fixed-wing aeroplane over stage-lengths of up to 250 miles.

The general belief is that the helicopter has, in fact, matured, and the second-generation models now coming forward are likely to lead to ever-widening uses for this ubiquitous type of aircraft in the years ahead, with the emphasis more likely to be on civil types than on military.

Estimates of the likely market indicate that military helicopter demand is likely to grow more slowly through the 1980s than in the civil field, with the former rising to about 15,000 machines by the end of the 1980s throughout the Western world, but with the civil market burgeoning to reach perhaps as many as 22,000 to 26,000 by the end of the decade.

By value, the civil expansion will be smaller than the military—perhaps about £4.3bn or so compared with the £7.5bn estimated for the military field. This is explained by the fact that the civil machines will be mostly the smaller, lighter type for executive use, whereas the military aircraft, although smaller in numbers, will be much bigger in size, carrying much more, expensive and sophisticated equipment for such tasks as anti-submarine warfare and search and rescue.

Much of the expanding civil use is likely to be in the executive and general passenger transport market, with about 25 per cent of the fleet being devoted to off-shore oil and gas industry support operations, about 10 per cent in aerial taxi or charter work and about 5 per cent directly involved in corporate ownership for executive flying duties. The rest of the civil fleet is likely to be

employed directly in a wide range of tasks, such as agriculture (crop-spraying and logging), for example, power-line inspection, police work of various kinds (including coastguard patrols and traffic control), and in civil engineering and construction.

In the forefront of this expansion of civil uses of helicopters will be the U.S. helicopter industry, whose output today is in excess of 1,000 aircraft a year. Under the undoubted stimulus of the oil industry, with a demand for efficient economic helicopters for the transfer of crews and supplies between the mainland and offshore platforms, the civil helicopter makers have made big strides, and some new civil types are now coming onto the market, such as the Bell 222 8-10 seat light twin-turbine aircraft and the Sikorsky S-76 Spirit 12-passenger aircraft, with a cruise speed of 187 mph and a range of close on 700 miles, ranging up to the big commercial version of the Boeing Chinook twin-engine medium-lift helicopter, which can seat 44 passengers or carry up to 46,000 lb of other payload.

## Types

There are several other civil types on the market. These include the Sikorsky S-61N, 26-30 seater, which continues to sell well, again mainly in the offshore petroleum industry market; the French Aérospatiale Puma; the 10-14 passenger twin turbine engine Dauphin Two; the Italian Agusta 109 Hirundo (a twin-turbine engine aircraft for up to eight passengers); and the smaller West German Bolkow 105S, a twin turbine-engine aircraft for up to five passengers, and the Bell Jet Ranger, a single-engine 4-5 seater.

Aérospatiale has also recently announced its new AS-355 Twin Star, a light-weight twin-engine aircraft derived from the successful Ecureuil aircraft. The prototype is now being built and will fly this September, with civil certification planned

for the second half of 1980, and deliveries in early 1981.

In the U.S., two of Sikorsky Aircraft's new helicopter programmes—one military and one commercial—are maturing—the U.S. Army's UH-60A Black Hawk, and the commercial S-76 12-passenger Spirit. Delivery of the first production Black Hawk to the Army last autumn launched a programme which calls for 1,107 aircraft through to 1986. The U.S. Army has already ordered 200 Black Hawks, worth more than \$400m.

Customer deliveries of the S-76 Spirit began in February, and the 1979 production scheduled calls for delivery of 75 aircraft, with production reaching seven helicopters a month. Even before certification, Sikorsky had booked 203 commercial orders, and expects sales to top 1,200 helicopters in the next decade, worth well over \$1bn.

Westland, as the sole helicopter manufacturer in the UK, already has substantial order books for its Lynx multi-role helicopter (279 ordered to date, of which 108 have been delivered), the Sea King anti-submarine and search and rescue helicopter (nearly 200 ordered, of which 160 have delivered), and the Commando variant of the Sea King, of which 47 have been ordered and 32 delivered. The company is also involved with France in the production of the Gazelle light, 3-seat fast general purpose helicopter, of which well over 800 have been built to date and which is still selling well, and the Puma, a medium general purpose transport helicopter, of which nearly 700 have been ordered and over 600 delivered so far. Westland is collaborating with Aérospatiale of France in the manufacture of the Super Puma SA-332, which it is hoped will be ordered by the RAF for the early 1980s.

In recent weeks, there have been difficulties over the funding by Arab states of the Egyptian Arab Organisation for Industrialisation, which was intended to both buy and eventually build under licence in

Egypt the Lynx helicopter and its associated Rolls-Royce Gem engine. Even if the AOI should eventually collapse, with the refusal of Saudi Arabia and others to finance it (because of anger over Egypt's peace treaty with Israel), it is felt that Egypt will still eventually need some Lynx helicopters, and there are still hopes of rescuing some part of the orders. Others orders for Lynx are also being actively sought in West Germany, South America, Denmark and in NATO for the Army version of the Lynx.

But it is in the field of new helicopters that Westland is now making substantial progress. It is engaged in the "project definition phase," funded by the Ministry of Defence to about £30m, of a new three-engine military helicopter, currently known as the WG-34, intended to be a "Sea King replacement." The pre-prototype aircraft should fly in about two years. It is hoped that other countries in Western Europe will join in this development, to make it an internationally collaborative venture.

Talks have been in progress for some time with Italy, whose own helicopter manufacturer, Agusta, is interested. At the same time, under the existing four-country Memorandum of Understanding on European helicopter development, plans for the WG-34 have been discussed with France and West Germany, in the hope of both countries joining in the programme. West Germany appears at this time to be less interested than France, because it is anxious to promote its own ideas for an advanced anti-tank battlefield helicopter for army use. But the French seem keen to join the programme, and could make a substantial contribution to its development for civil market.

The talks between the four countries will continue, but it may be some time before any definitive international agreement on the WG-34 emerges. Meanwhile Westland continues with the project under MoD contract.

But of equal significance for



Westland Helicopters, of Yeovil, has spent £10m of its own money developing a new utility transport helicopter, the WG-30 (pictured here), intended for both military and civil markets world-wide. Derived from the company's Lynx multi-role helicopter, which is already in service with the British Army and other countries' armed forces, the new WG-30 prototype is already flying, and will be publicly demonstrated for the first time at the Paris Air Show

its future, Westland has spent £10m of its own money in developing a new transport helicopter, the WG-30, a 17-21-seater, twin-engine (Rolls-Royce Gem turbines) aircraft, designed for a wide range of tasks. Primarily intended initially for the foreign military market, the civil market is also envisaged in the longer-term,

where it could be used for executive and utility transport, as well as in off-shore oil support duties. Although the WG-30 clearly owes much to the Lynx design, it is a completely new structure, specifically to meet the needs of operators engaged in rugged operations who need a strong, versatile machine of compara-

tively low cost—about £1.25m to buy. While the company foresees its immediate orders emerging from the foreign military market, where sales of more than 100 aircraft are hoped for over the years immediately ahead, the WG-30 nonetheless represents Westland's bid to get into the burgeoning civil

markets for helicopters which hitherto have been dominated by the major U.S. manufacturers. It will ensure that Westland is not left behind in what is clearly likely to be one of the most rapidly expanding areas of world aerospace.

M.D.

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Producing high technology jet engine pods for the Boeing 747 and 757, the Lockheed TriStar and the British Aerospace 146

Making the wings for the Fokker F.28 Fellowship jetliner

Building the main landing-gear doors for all 747 Jumbo jets produced at Boeing's Everett plant

Making a whole range of flight and structural components for the TriStar

Manufacturing a highly successful range of surface-to-air guided weapons, including the new Blowpipe man-portable missile—now operational with NATO forces; Seacat, the world's most widely used guided weapon, in service with 16 navies; and Tigercat, employed by the armed forces of six countries.

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# Combat aircraft projections

MILITARY AIRCRAFT manufacturers world-wide are agreed that the market for combat aircraft of all kinds will remain buoyant through the 1980s, despite continued pressure from Governments for reductions in arms sales of all kinds, using the ceiling imposed by the U.S. itself of \$8.4bn on annual sales to non-allied countries as well as the loss of recent orders, for example from Iran and Egypt.

These manufacturers collectively believe that upwards of 10 new combat aircraft are likely to be ordered throughout the next decade, with an estimated total value of more than \$20bn (over \$30bn), including research and support costs throughout the lives of the aircraft squadrons.

The figure is only a broad estimate, for no specific detailed studies of future military aircraft markets are available—largely because of the sensitive nature of the market, and also because of political uncertainties about various countries' long-term intentions.

## Replaced

But the estimate is based on the fact that several current types of aircraft in service will be replaced progressively through the 1980s—1990s—for example, over 1,000 Phantoms, and over 1,000 fighters. The air force inventories of the U.S. and some other countries in Western Europe, already beginning to be replaced with new production, including McDonnell Douglas F-15s, General Dynamics F-16s, and other types, while in Western Europe, the Tornado Multi-Role Combat Aircraft begins to move service next year. The and for new combat aircraft in the years ahead will include all types of aircraft—light combined trainers strike aircraft, through to complex multi-role aircraft with highly sophisticated weapons systems.

Most of the orders are likely to be in the U.S., which is the largest military aircraft builder in the Western world. But notes for the market through the 1980s outside the and other NATO countries

indicate that it could amount to close to \$46.5bn (or more than £23bn), broadly divided into four major categories, according to size and weight of aircraft.

Category A, which covers light strike-trainers and comparable aircraft of 3,000 to 8,000 kilograms weight (such as the Strikemaster, Hawk, Alpha-Jet and Macchi 329 and 339), could be worth up to \$7.8bn or about 16 per cent.

Category B, for ground-attack aircraft of 8,000 to 12,000 kg, such as the Harrier, the Hunter, the Northrop F-5, could amount to as much as \$12.7bn or 25 per cent.

Category C, for larger strike and air superiority aircraft of 12,000 to 18,000 kg (such as the Jaguar, Mirage F-1, F-16s and F-18s) could account for about \$15.75bn, or 36 per cent.

In Category D, for complex multi-role aircraft types above 18,000 kg (such as the F-15, the Grumman F-14 Tomcat and the Swedish Viggen, among others), the market could be worth some \$10.2bn, or 23 per cent.

By far the most significant military aircraft programme now under way in Western Europe is the Tornado multi-role combat aircraft, in which more than 70,000 workers in three countries—the UK, West Germany and Italy—in more than 500 companies are building 809 aircraft for the RAF, Luftwaffe, German Navy and Italian Air Force. The first production MRCA is due to fly this summer, and the first deliveries to the German Luftwaffe and RAF will be made next year.

The Tornado is a two-seat, twin-engine, swing-wing aircraft (variable geometry) military aircraft that will be capable of flying at more than twice the speed of sound (Mach 2.2 or 1,500 mph) at great heights, and also at supersonic speeds at low level.

Of the 809 production aircraft (16 prototypes and pre-series pre-production aircraft have also been built and are now flying) the RAF will be taking 383, of which 220 will be of the basic interdiction strike and attack (IDS) version, and 165 will be the Air Defence Variant (ADV). West Germany will be taking 324 IDS aircraft for the

Luftwaffe and Marineflieger (German Navy Aviation), while Italy will be taking 100 for the Aeronautica Militare Italiana. So far, 150 of the 809 production aircraft have been authorised, of which 73 are for the RAF, 57 for the Luftwaffe and 15 for the Italian air force. But a further production batch of 164 aircraft is due to be announced any day now, bringing total production authorised to 314 aircraft.

## Tempo

Further batches of production aircraft will be authorised at intervals, so as to maintain the tempo of production through the mid to late 1980s. The estimated unit production cost of each Tornado of the IDS version is \$2m at September 1978, economic conditions, while that for the ADV Tornado is £10.7m. This gives an estimated production cost for the 644 IDS aircraft of nearly £5.8bn, with nearly £1.8bn for the 165 ADV aircraft, or a total production cost for the entire programme of about £7.6bn. If research and development costs are also taken into account, the overall programme cost seems likely to be more than £8bn spread across the three countries involved; and over a period of more than 10 years.

The Tornado aircraft is being designed to fill several major roles:

**Battlefield interdiction**—the support of ground forces in the forward battle zone, requiring large weapons payloads and excellent manoeuvrability.

**Interdiction / counter air strike**—destroying the enemy's ground installations, supply depots, airfields and communications.

**Naval strike**—delivering a wide variety of weapons in all weathers against ships and coastal installations.

**Air superiority**—denying the freedom of the air to the enemy, and giving protection to friendly ground or naval forces.

**Interception-Air Defence**—Long air patrols far out over the Atlantic to destroy incoming enemy bombers at high altitude, while long-range recon-

naissance at all heights is essential to the planning of ground and air operations in war-time.

**Training**—This is most effective in a two-seat aircraft, such as the Tornado, of which a trainer version is being built.

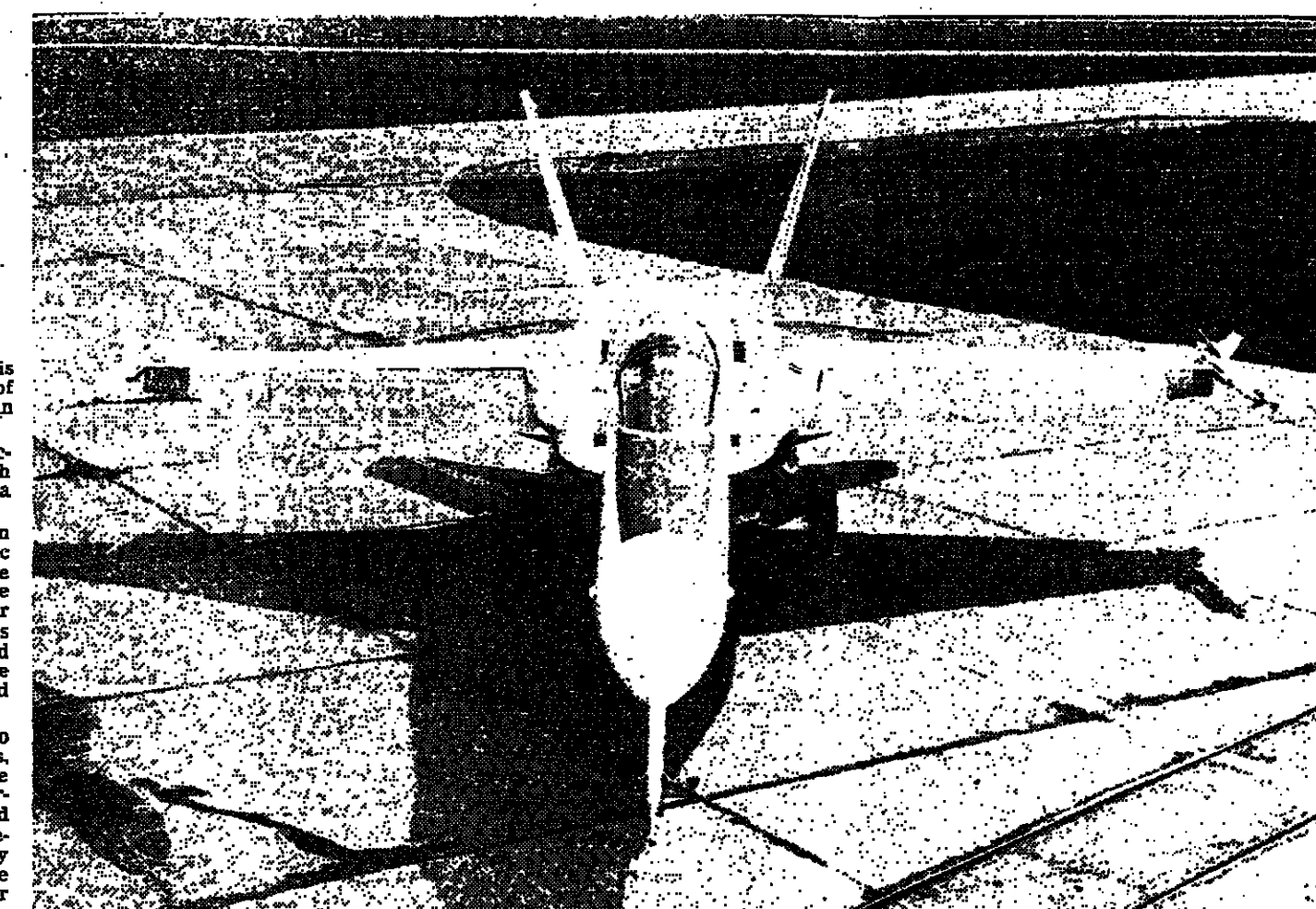
The Tornado is being built in two principal versions, the basic version or interdiction strike (IDS), capable of all the above roles except interception/air defence. This latter task is being allocated to a specialised version, the ADV or Air Defence Variant, which will be used solely by the RAF.

For the Luftwaffe, the Tornado will replace the Phantom, Phantoms and Buccaneers in the overland strike, battlefield interdiction, reconnaissance and maritime strike roles, and replace Lightnings and eventually also Phantoms in the air defence role, eventually comprising over half of the RAF's front line.

For the Luftwaffe, the Tornado will replace F-104 Starfighters in the counter-air, battlefield and interdiction roles, while in the German Navy it will also replace F-104s. For the Italian Air Force, the Tornado will replace F-104s in the primary roles of air superiority, reconnaissance and support of land and naval operations.

The Tornado is being built by a three-nation consortium, called Panavia, which comprises British Aerospace, Messerschmitt-Bölkow-Blohm in West Germany, and Aeritalia of Italy. The RB-199 engines for the aircraft are being built by another group, Turbo-Union, comprising Rolls-Royce, Motoren-und-Turbinen Union of West Germany, and Fiat of Italy.

Tornado has been entered by Panavia in the contest to find a new tactical aircraft for the U.S. Air Force—a requirement for what is called an "Enhanced Tactical Fighter" or ETF for the mid-1980s. Panavia's partner in this is the U.S. company, Grumman Aerospace, which builds the F-14 Tomcat fighter. Tornado's chances can be considered promising, for the USAF deputy chief of staff has already flown the aircraft and has said that Tornado has "a very high degree of evolutionary



The latest strike fighter in the U.S. inventory is the F/A-18 Hornet, for the U.S. Navy and Marine Corps, now in production by McDonnell Douglas at St. Louis, Missouri, with an intended total output of 811 aircraft. Northrop, of Hawthorne, California, is the major sub-contractor to McDonnell Douglas, undertaking 30 per cent of the airframe development work and 40 per cent of the airframe production work. The Hornet will replace two naval aircraft, the F-4 Phantom, and the A-7 Corsair attack aircraft.

development based on what we have to put together—terrain avoidance radar, terrain-following radar, the swing-wing and its ability to reduce the gust-loading on the aircraft at high speed, which is very effective."

For the RAF, another major new aircraft programme is now being planned. This is the eventual Harrier-Jaguar replacement, for a high-speed battlefield tactical support aircraft. Currently known as Air Staff Target 403 (AST-403), much work has been done on the preliminary design in the UK. But in view of the expense of such a programme, major efforts are now being made to try to find partners for the programme on the Continent, primarily in France and Western Germany. If those countries do have corresponding time-scales for the supply of a new tactical aircraft and are willing to participate in a major international programme (and both France and West Germany have ideas for new aircraft of their own) then the design so far developed for the AST-403, which is believed to include short-take-

off and landing (STOL) as well as swing-wing, may have to be modified to accommodate the other countries' ideas.

Thus, it may be some time before any final decisions are taken on the AST-403 programme, and there is no guarantee at this stage that it will be developed at all, at least in the form as it has evolved so far. But that some such new tactical combat aircraft will be required in Western Europe is generally accepted, and the only alternative to indigenous manufacture will be to buy an aircraft from the U.S., which none of the aerospace industries of Western Europe really want to see happen. Thus, there is already a wide measure of agreement in Europe at industry level on the need for a common design.

If a Western Europe design is eventually built, it seems likely that the task will be given to the existing Panavia combine, which was set up to undertake Tornado design development and production. This joint company perhaps could even be widened to include representa-

tives from the aerospace industries of other countries that might participate. It would seem to be unnecessary to set up new, rival machinery to undertake a task for which Panavia is already eminently suited.

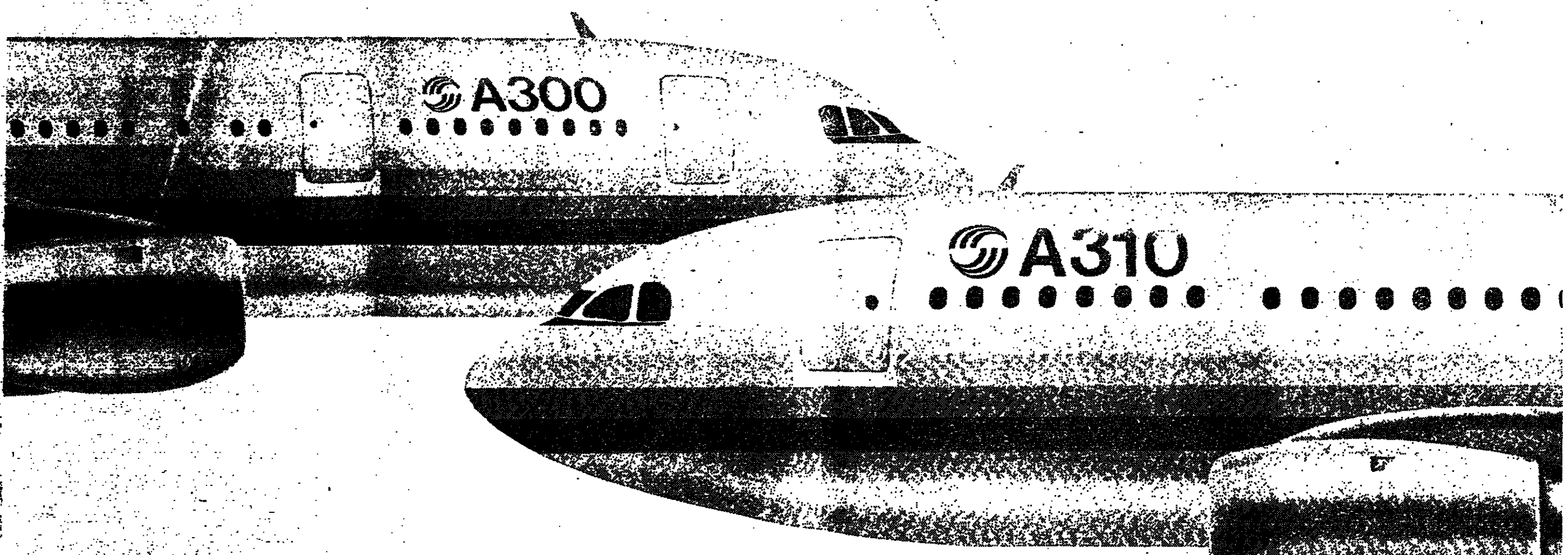
Meanwhile, British Aerospace has several other major military aircraft programmes in hand. The Hawk trainer is doing well, with over 100 aircraft (out of an order for 176) already delivered to the RAF and a follow-on order likely soon. The search for overseas orders to support those already won from Finland (50 aircraft), from an east African country, and from Indonesia, continues.

"Request for Proposals" later this summer, in which BAe is expected to submit the modified Hawk.

Work on the Harrier vertical take-off and landing aircraft continues. Orders to date amount to 263 aircraft, plus another 35 Sea Harriers, and modifications to the aircraft for use through the 1980s include fitting a new wing to improve performance and weapons loads. The first of the Sea Harrier version is due for delivery to the Navy in June, and negotiations with India for an initial purchase have reached an advanced stage. The "Ski Jump," a device which enables Harriers to become airborne much more swiftly, and to carry bigger weapons loads, is attracting much attention world-wide.

In the U.S., approval has been given for the development stage of the Advanced AV-8B Harrier (two YAV-8Bs modified from UK-built AV-8As), but fiscal 1980 funding for full-scale development is still being debated in Congress.

M.D.



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**Airbus Industrie**



AEROSPACE VIII

# Growing share for equipment

**WORLD MARKETS** for aerospace equipment and systems, in the air and on the ground, have reached such proportions that they are now more important creators of employment and spin-off technology than the airframe industry itself.

In Britain, which has Europe's largest aerospace industry, only 15,000 employees out of the industry's total of 80,000 employees work directly in the airframe construction. The rest find their rewards in the manufacture of parts, equipment, and components of all kinds, as well as in engine manufacture.

A similar proportional breakdown seems likely in other European and U.S. aerospace industries. In terms of value, equipment manufacture now ranks roughly equal with engines and airframes as a contribution to the cost of a completed aircraft. In addition, there is the growing world market for ground operations equipment.

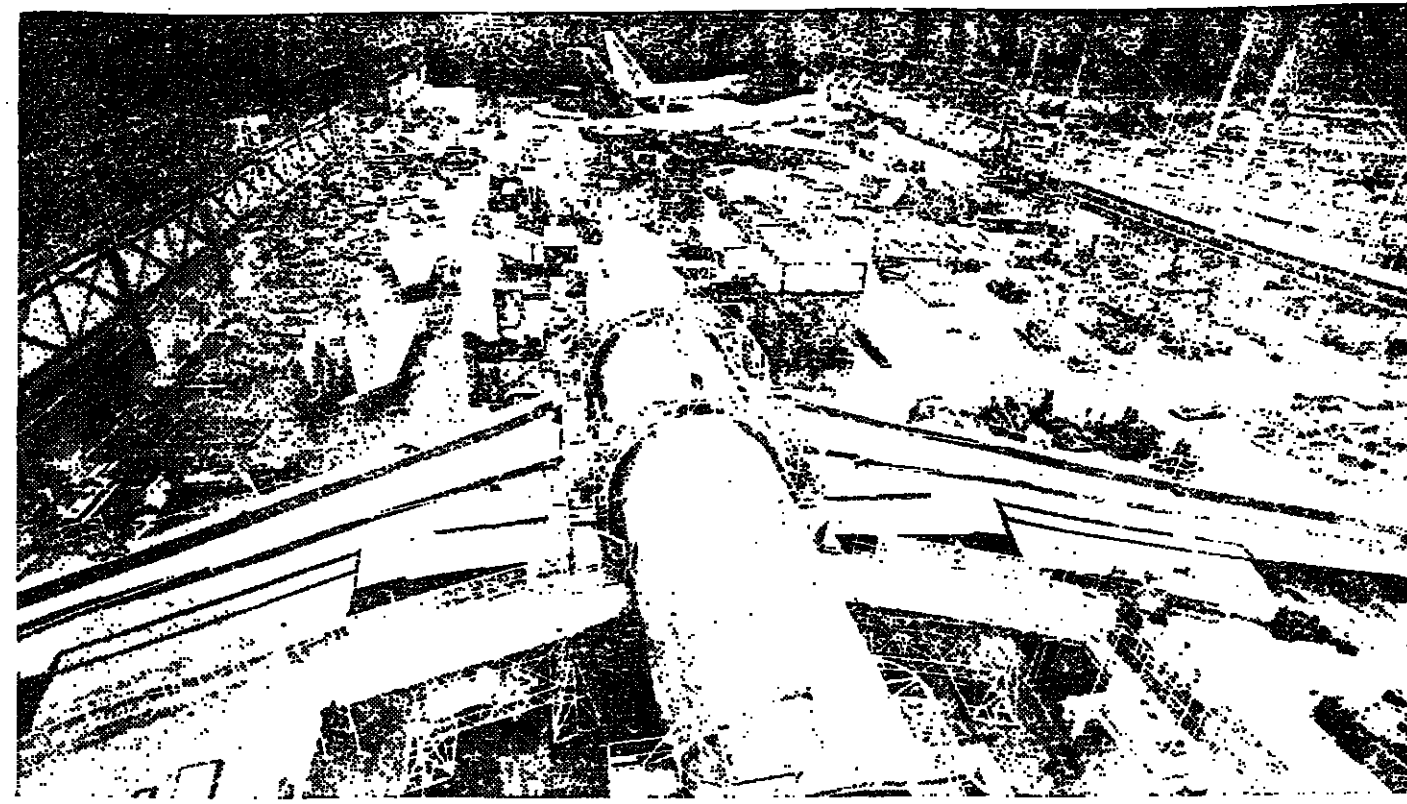
A total of over £60bn is expected to be spent across the total world market for civil aircraft maintenance, equipment and parts (both for scheduled airlines and general aviation), air traffic control systems and airport ground handling equipment in the decade to 1985, according to estimates by the International Civil Aviation Organisation.

The figure does not include spending on military aircraft, equipment and systems, but total estimates in this sector are rather more difficult to quantify.

A high proportion of new equipment destined for these aircraft has been designed with a firm eye on low weight and compact design. This applies to military aircraft as well as civil aircraft. In all new aircraft the design is dominated by the need for vital size and weight reductions on all types of equipment.

The miniaturisation which has resulted from advances in electronics in all fields has been of particular benefit to aircraft designers. This has opened the way for even small aircraft to be fitted with advanced avionics (aircraft electronics).

One of the most useful advances for small aircraft is the lightweight weather radar system developed by RCA. The antenna and much of the electronic heart of the system, known as the Weather-Scout I, is designed to fit into the leading edge of the wing of small aircraft. The radar gives warnings of nearby storms and thunder clouds without the penalty of a high drag-inducing radar pod. The novel design is thought to be one of the most revolutionary weather radars to



Assembly of 747s at Boeing's Everett, Washington, plant sums up the mass of components involved in aircraft manufacture

enter mass production and is now being demonstrated on a Piper Lance II aircraft.

The RCA Avionics company has recently produced new designs for its weather radar range. The Primus 200 Color-Radar has a range of 200 miles and will alert the pilot to problems ahead.

Britain has a wealth of radar design and manufacturing experience and many new systems will be on display at Paris. Cossor Electronics, of Harlow, Essex, has designed a secondary radar system for airports which was announced earlier this year after an 18-month trial.

The ADSEL system is said to be one of the first secondary radar systems to have the capability of interrogating and identifying, selectively, every aircraft within its range. Cossor Electronics designed the system in conjunction with the Civil Aviation Authority and the Royal Signals and Radar Establishment.

The system is now fully operational at the Matching Green experimental station, and four British Midlands Airways aircraft have been fitted with Cossor equipment. Operational trials using scheduled flights have already started.

In the military sphere, two British radar companies,

Marconi and Plessey, have agreed to form a new UK company, UKADGE Systems, with Hughes Aircraft of the US, in an attempt to win part of the equipment contracts for improving Britain's air defences.

The joint company will submit proposals this year and the final award of the UKADGE (United Kingdom Air Defence Ground Environment) contract is expected to be announced by the Ministry of Defence in the first quarter of next year.

### Exhibit

Marconi Avionics, a member of the GEC-Marconi Electronics group, is to exhibit at the Paris Air Show a model of the new advanced interception radar for the Air Defence Variant of the European Tornado Combat aircraft, which Britain plans to use in addition to the basic strike versions of the aircraft.

A fuel flowmeter based on microprocessor technology has also been developed by the company for use in the British Aerospace Hawk jet trainer aircraft. This will also be displayed at Paris, alongside a fold-away head-up display the company has developed from its military experience for use in civil airliners.

The increasingly vital area of fuel management for commer-

cial aircraft will feature at Smiths Industries' stand at the Paris Air Show. The company has developed a digital fuel management system, and animated displays will explain full details of flight operations. The company's SIS-10 autothrottle system is already in service on the Boeing 727 and 737 and is designed to provide optimum thrusts over all flight sectors.

Allied to fuel management technology is the field of hydraulics systems for aircraft and a range of systems are expected to be displayed at Paris, including equipment on the Pilatus Britten-Norman Islander and Trislander aircraft—which are now approaching a landmark in British light aviation with their 1,000th aircraft sale. Fairey Hydraulics of Heston, Middlesex, has been associated with the aircraft for many years and this company announced before the Paris show that it had won orders worth over £800,000 for landing gear shock absorber struts for the Islander and Trislander.

Another vital area of aircraft

equipment is fire fighting equipment. Britain has a number of companies representing this field, and last month Wilkinson Match Group, which owns Gravier, one of the market leaders in fire protection equipment, announced a significant expansion in this field.

Wilkinson Match acquired—jointly with Allegheny Ludlum Industries of the U.S.—HTL Industries of Arcadia, California.

HTL is one of the world's foremost fire extinguishing equipment manufacturers. Under the new arrangement, the company will pool its expertise with that of Gravier to bid for major new U.S. civil and military contracts in aircraft fire protection. Outside the U.S., Gravier and HTL will continue to operate separate and parallel sales and distribution organisations. But inside the U.S., the two companies plan to bid for contracts for fire detection and extinguishing systems on the new generation of Boeing 757 and 767 airliners and other aircraft.

Fire prevention is also a major source of work for companies supplying equipment for use at airports and in fuel storage areas. The Fire Vehicle Division of Chubb Fire Security of Middlesex, designs, manufactures and markets special high performance airfield crash trucks. These are used by civil and military aircraft authorities in 45 countries, part of a world market which Chubb has estimated to be worth £35m a year.

The main areas of the world where demand for crash trucks has been expanding over the last three years include the Middle East and Africa. Last year these zones accounted for over half and almost a quarter respectively of Britain's exports of these vehicles.

Airport equipment of all types is a rapidly growing part of the aerospace equipment industry output. Britain's National Economic Development Council (NEDC) believes the reward from the airport equipment market are potentially so great that steps have been taken to develop a national catalogue of British airport products. It will be published by the British Overseas Trade Board, the British Airports Authority and the Civil Aviation Authority.

The idea arose out of "Design and Export" reports from the Civil Engineering Economic Development Committee, part of NEDCO, which was published two years ago. The report outlined the importance of overseas airport contracts for Britain's civil engineering companies.

The catalogue is expected to be ready in its first edition next year's Farnborough Show.

The prize is enormous. The International Civil Aviation Organisation has estimated that total airport construction and maintenance contracts will worth over £6bn between 1980 and 1985. In addition there is likely to be a need for new air traffic control systems worth up to nearly another £6bn; this includes only a third of estimated £1.5bn expenditure forecast by ICAO for implementing the new microwave landing systems. Airport control systems will be another £2.5bn to the bill, developing the world's new existing airports into the 1980s.

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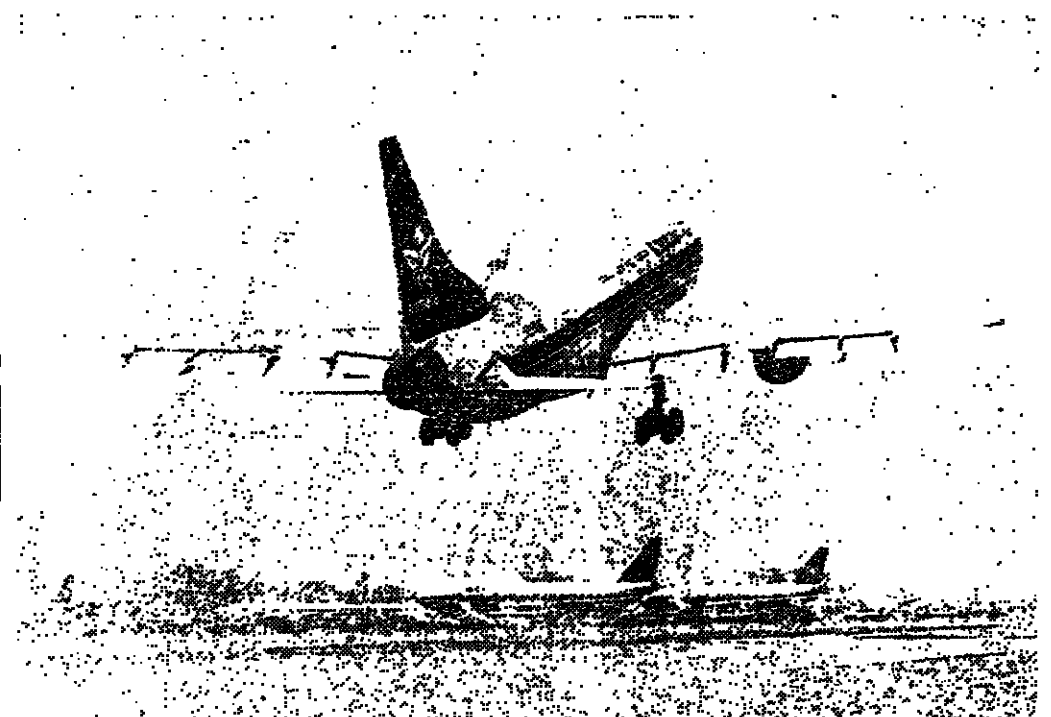


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# Satellites pay their way

THE MOST significant trend in space research world-wide is the increasing emphasis on making this expensive arena of activity earn its living. Thus there is a growing use of unmanned near-Earth orbiting satellites, both for scientific purposes and for a wide range of direct applications in the service of man.

The unmanned satellite in fact promises to become one of the most valuable tools ever invented. It is estimated that the use of satellites for a wide variety of tasks, including communications, weather forecasting, environmental observation, and earth-resources monitoring, is already saving industry large sums a year.

A study by the U.S. National Oceanic and Atmospheric Administration (NOAA), for example, shows that satellite observations of the Earth's atmosphere and surface are saving industries and government \$172m a year in the U.S. alone, while this could probably be multiplied several times if similar savings elsewhere in the world are taken into account.

## Beneficiary

The NOAA suggests that the U.S. agricultural industry may be the biggest beneficiary, by showing, for example, the progress of crop-killing frosts during winter nights, thus helping agriculturalists to know when to turn on heating systems. The Hawaiian sugar cane industry uses satellite data in its crop management, while other agricultural sectors are finding, increasingly, that the short-term data available from satellites is especially valuable in helping to protect perishable commodities that require precise production techniques.

The marine industries are also benefiting considerably. The Gulf of Mexico and Atlantic shipping interests are finding that satellite data can locate the constantly changing position of currents such as the Gulf Stream, enabling ships to make faster voyages. The Exxon oil group alone estimates that the use of such data for navigation can save its tanker fleet up to \$360,000 in fuel a year. Fishermen in the Pacific use satellite

data on the "heat boundaries" in the ocean to detect fish shoals, thereby improving catches to the sum of over \$2m a year. The U.S. Coast Guard saves \$5m a year in reduced aircraft flight hours by using satellite data.

In weather forecasting, hurricane observations, local and global weather forecasting, and other meteorological uses, satellites are not only saving many human lives, but probably also resulting in hidden savings of billions of dollars in industry and the community at large.

In telecommunications, the satellite is now an accepted and proven means of international telephone, TV and data facsimile transmission of incalculable value to the world business community. Communications via satellite, in fact, is not only increasing in volume annually, but decreasing in real cost. Indeed, the International Telecommunications Satellite Organisation, which runs the global communications satellite network, has cut its monthly charge for a full-time, two-way telephone circuit by 16 per cent to \$960. The same service in 1965 initially cost \$3,394. If that charge had risen with inflation, the cost today would have been about \$11,000. Intelsat, which includes more than 100 nations, has in fact lowered its rates for nine consecutive years.

It is because of this increasing emphasis on the unmanned Earth satellite for an ever-widening variety of uses that particular emphasis is now being placed upon methods of launching them. In the U.S., the National Aeronautics and Space Administration (NASA), which has traditionally used the booster rocket to place satellites in orbit, is now well down the road towards first operational orbital flight early next year of its Manned Reusable Space Transportation System—known as the Space Shuttle.

This system comprises an "Orbiter" vehicle, the size of a small airliner (the first of which is called Columbia), which will be sent into orbit by two "Booster" rockets. The Orbiter will carry a small flight crew and a small team of

scientists or other astronauts. Both Orbiter and Boosters are designed for recovery and refurbishing for future use—each Orbiter is designed for 100 space missions, and each Booster for 20 missions. The Boosters will fall into the ocean for recovery and shipment back to the Kennedy Space Centre in Florida, while the Orbiter vehicle will fly back into the Earth's atmosphere on completion of a given mission (such as placing a satellite in orbit) to land at the Kennedy Space Centre like an ordinary airliner.

## Launching

The aim of this system is to provide a frequently usable, and therefore hopefully cheaper, system of satellite launching. The Orbiter will launch a cargo bay containing satellites or other payloads for scientific or other experiments in space.

In Europe, however, the European Space Agency (ESA), which is the Government-sponsored body representing most countries of Western Europe, is devoting much of its time and resources to development of the more conventional rocket launching system, the Ariane, as an independent system, an insurance measure against any possible failure of the Shuttle to meet the claims made for it in the U.S. Work on the Ariane has been under way for some time both in Europe and at the ESA's launching base at Kourou, French Guiana. The first Ariane will be launched later this year, but already the ESA is contracting for payloads for the first handful of launches, including various scientific telecommunications and other satellites.

In addition to the Ariane, however, the ESA is working on the Spacelab, a manned orbital workshop that will be Europe's major contribution to the U.S. Space Shuttle.

Designed to fit into the cargo bay of the Shuttle Orbiter vehicle, the Spacelab will enable scientists to work in shirt-sleeve comfort in space on a wide variety of missions. While in effect

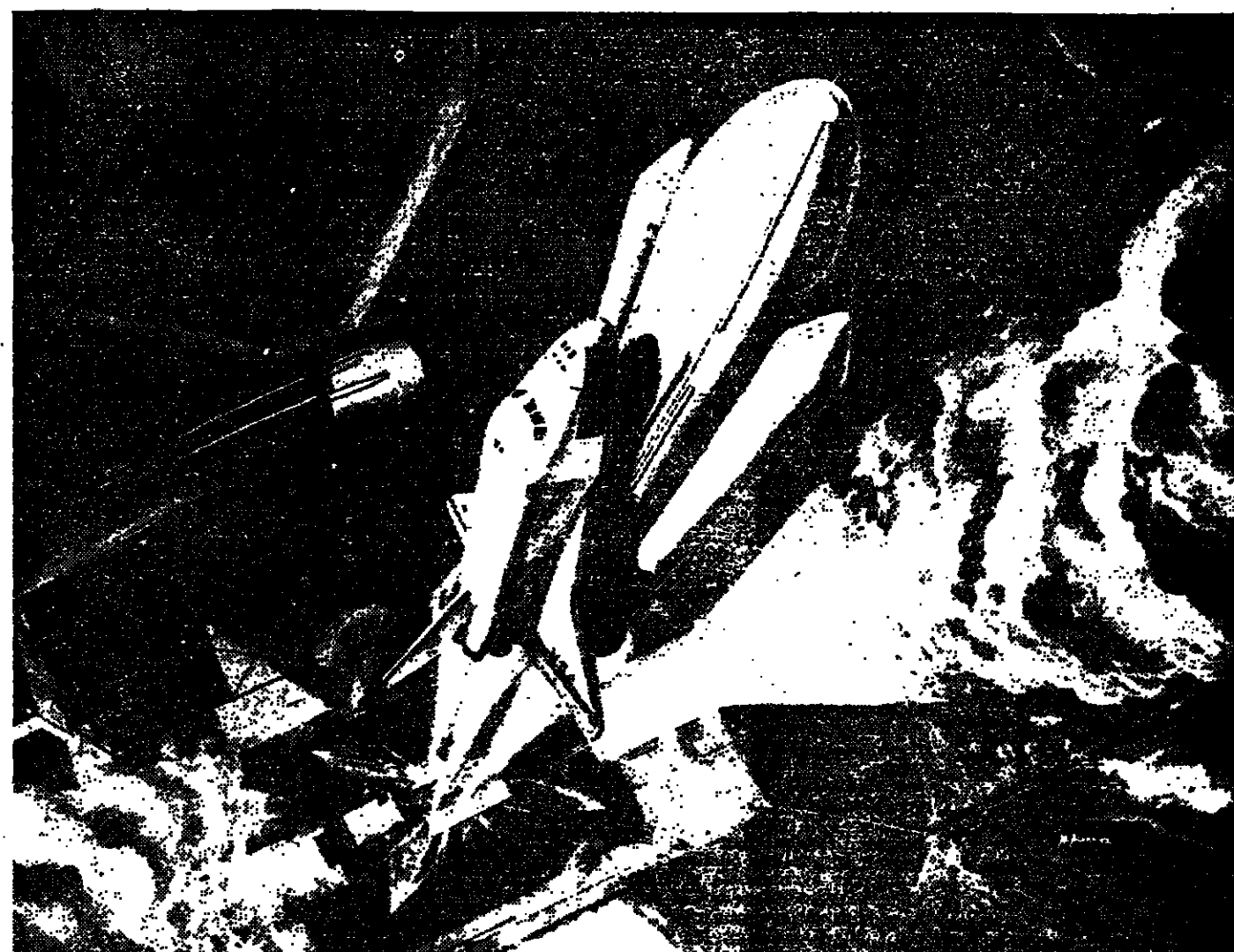
Europe's contribution to the Shuttle, it is really more than that, since it will give European scientists, and industry, a chance of gaining experience of manned orbital space flight that they would not otherwise get, since Europe is not itself developing any other manned orbital vehicle.

But although much of the emphasis is now on satellites and their launching systems, the other widely varied aspects of space research are not being ignored. While out of 16 launches on the NASA schedule for this year, most are for earth-orbiting satellites for scientific research and application technology purposes, the Administration has some other notable space activities in hand. These include the Jupiter and Saturn planetary encounters by two Voyager spacecraft, and a fly-by of the Rings of Saturn by the Pioneer Eleven spacecraft.

The Voyager I spacecraft, launched from Earth on September 5, 1977, made its closest approach to Jupiter in early March and is now travelling on to make a close approach to Saturn on November 12, 1980. Its sister spacecraft, Voyager 2, launched on August 20, 1977, makes its closest approach to Jupiter on July 9, this year, and will go on to Saturn, reaching that planet on August 27, 1981. The Pioneer Eleven spacecraft, launched on April 6, 1973, on a primary mission to fly-by Jupiter, is scheduled to make its closest approach to the Rings of Saturn on September 1, this year.

The NASA programme of launches this year includes a number of research and other satellites for the U.S. Defence Department, but others of significance include the UK-6 scientific satellite, to be launched on a Scout vehicle from Wallops Island, Virginia, early this month; the Westar-C communications satellite, to be launched from Cape Canaveral in July; and two other communications satellites, Intelsat V-A and V-B, both for the U.S. Communications Satellite Corporation which manages the global system for Intelsat.

A U.S. domestic communications satellite for RCA is due to be launched in December, but prior to that there will be several launches of scientific satellites, including the High Energy Astronomy Observatory-C (HEAO-C) in September; MagSat-A, a magnetic field research satellite, in September; the Solar Maximum Mission satellite in October; and a Weather satellite, NOAA-B, for the National Oceanic and Atmospheric Administration, in December. Looking much further ahead NASA and the ESA have signed an agreement for a joint International Solar Power Mission in 1983, to observe the sun for the first time from above its Polar regions.



An artist's impression of how the Space Shuttle will look when being blasted off from the Kennedy Space Centre in Florida. The Orbiter manned vehicle (left) is carried on the back of the combination of the big Booster rockets and additional fuel tank.

provision of two ECS spacecraft has been signed between the ESA and Interim Eutelsat, an organisation comprising the telecommunications administrations of 17 European countries, but eventually five satellites will be required to meet the system's long-term requirements.

## Maritime

A new organisation, the International Maritime Satellite Organisation, is now being set up to operate a global maritime satellite communications system enabling ships worldwide to communicate with shore-based offices much more easily than ever before. Countries participating include the U.S., UK, Soviet Union, Norway, Japan, Spain, Australia, India, New Zealand and Egypt. One of the first tasks will be to select the satellites, the candidates for which are Intelsat 5, MARECS, developed by the European Space Agency, and the U.S. Comsat General Corporation's Marisat, which is already opera-

tional, having been used by the Navy for some time. One of the special developments now occurring in space is the growing interest shown in satellites of various kinds by developing countries in the Third World—the so-called "Regional Satellites" for a wide variety of tasks, but primarily communications. The British Aerospace Dynamics Group, for example, has put forward a plan for a communications satellite to meet the needs of the rapidly developing Arab States—ArabSat. This would be based on the European Communications Satellite, for which the Dynamics Group is already the prime contractor to the ESA.

This kind of "Regional Satellite" is becoming possible at a reasonable price because of the rapidly improving technology in unmanned satellites. This has reached the state where the satellite itself has become virtually a "bus" type of vehicle of standard basic design, into which a widening variety of payloads for different tasks can be

added. As a result, there is intensifying competition throughout the world among the major satellite manufacturers, including British Aerospace, to win this kind of contract from the developing countries.

Finally, considerable interest is now being shown, especially by British Aerospace, in the provision of solar power satellites. Studies have shown that such satellites could be developed by an extension of existing technological knowledge, while the investment needed would be comparable with that required for other major power sources. Such satellites, if developed now, could be producing electricity for consumption on Earth at competitive prices by the turn of the century. The satellites would receive energy from the sun via large arrays of photoelectric cells, converting on-board into microwave radio energy, and beam it towards large receiving antennae on the Earth's surface.

M.D.

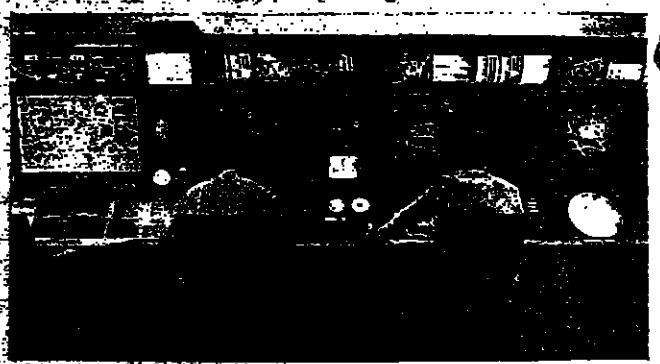
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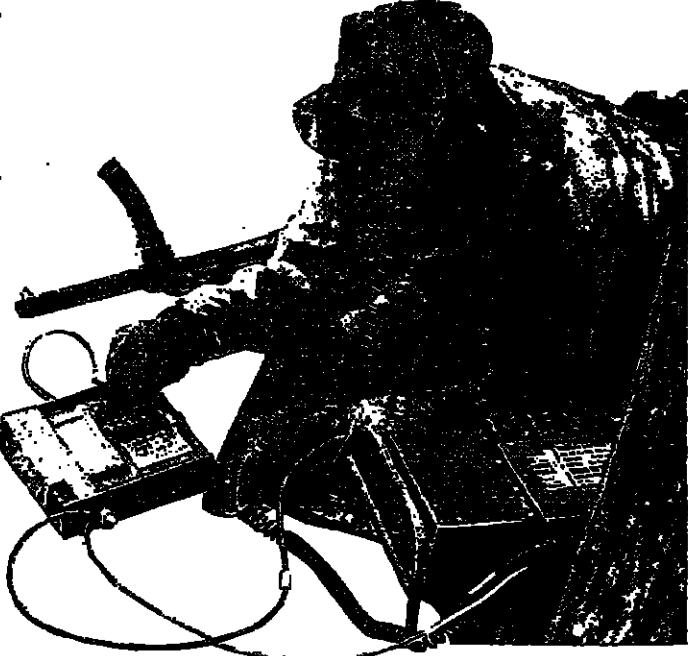
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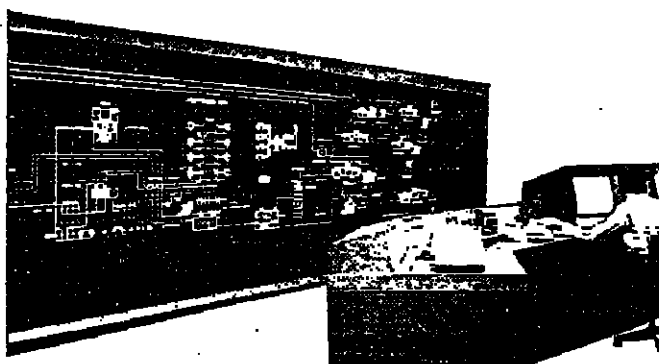
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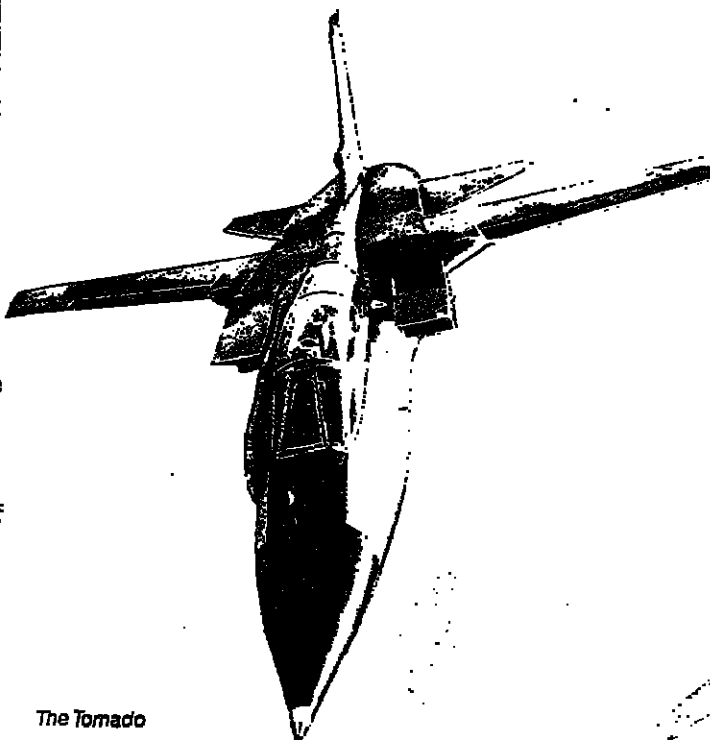
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# COSSOR electronics

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# Private wings for the executive

**BUSINESS AVIATION** — the use by business executives of companies of private aircraft in place of regularly scheduled airline services — has been expanding rapidly in the past few years throughout the world, especially in the U.S. and Western Europe, and seems likely to continue to grow, despite the parallel growth of scheduled airline activities.

While undoubtedly in recent years the regular airlines have made some considerable efforts to woo the business traveller, who still accounts for more than half of their traffic, more and more businessmen are discovering the delights and benefits of having their own aircraft at their disposal.

The reasons are not far to seek. In many cases, the regular airlines' schedules, while expanding, remain for many businessmen inflexible, whilst delays at airports arising from growing congestion have also left many businessmen feeling frustrated and angry.

There has also been a mounting resentment at the way in which the business traveller has been left behind by many scheduled airlines in favour of the cheap fare travellers.

The latter in recent years have been enjoying on many flights the same standards of comfort and convenience and cabin service as businessmen paying much higher fares. The result has been a belated attempt by the airlines to improve the lot of the business traveller, with special cabins and other frills, and these have undoubtedly helped to generate more business travel. But for many, the trend towards the greater exclusivity, and the freedom from noise, bustle, pressure and waste of time, that come from private or corporate aircraft, is irreversible.

## Links

In addition to these personal motivations, the reasons for the growth of business aviation also include the growth of international links by many companies, necessitating speedier communications between sometimes remote factory or office locations. There is also, surprisingly to many businessmen, a considerable saving in money as well as time using one's own aircraft, fixed-wing or helicopter. It is often possible to conduct in one day business in several different places that would otherwise

require two or three days if the scheduled airlines were used instead, and involve hotel and meal bills which in many places can now be very expensive. Where an executive's time means money—as in most cases it does—the benefits of a private aircraft thus become much more apparent.

The result is that while many businessmen will continue to use the scheduled airlines, the business aircraft manufacturers and the growing number of companies providing aircraft on an ad hoc charter basis have never been doing so well.

It has been estimated that in the current year, for example, the U.S. manufacturers of business and light aircraft of all kinds (collectively known as "general aviation") will sell close to 15,200 aircraft, worth over \$2bn. While many of these aircraft will be light single-engine aircraft for the leisure and sporting flying market (more than 13,000), with a substantial number also going for agricultural aviation of various kinds, there will still be a substantial number of aircraft being acquired for business aviation—about 548 multi-engine turbo-prop aircraft, worth close to \$400m, and about 231 turbo-jets, worth close to \$380m.

Figures for sales in other parts of the world are not available, but most reports suggest that the upsurge in sales and use of business aircraft in the U.S. is being paralleled in Western Europe (including the U.K.). In the Middle East and Australasia, and to a lesser extent in other parts of the world.

If the entire "general aviation" market as a whole is taken into account, it is estimated that worldwide, the sales of general aviation aircraft up to 1983 will amount to close to £14.8bn, of which perhaps one-third by value will be business aircraft of various kinds.

One of the factors tending to promote the use of business aircraft is the current fuel shortage and the rapidly rising price of aviation gasoline. It is claimed that general aviation aircraft tend to use less fuel per seat mile than many of the biggest jetliners, so that whereas fares on scheduled airlines will tend to rise the cost of business flying in smaller, privately-owned aircraft will rise at a slower rate. A 400-

seat Boeing 747 Jumbo, for example, averages 40 seat-miles per gallon, but a six-passenger Piper Lance averages 75 seat-miles per gallon, while the six-seat Beechcraft Bonanza gets 72 seat-miles per gallon, as does the seven-seat Cessna 207.

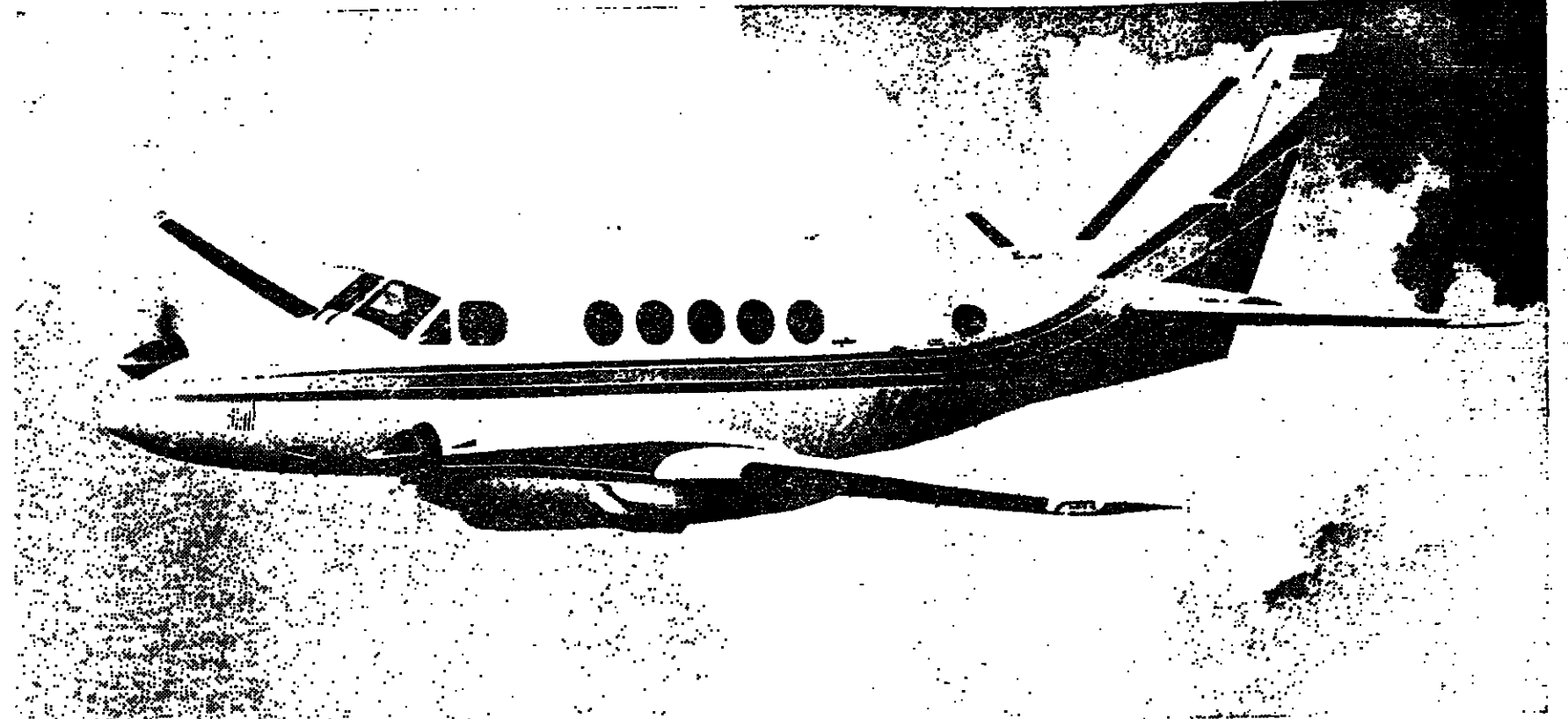
The U.S. general aviation fleet consumes only 71 per cent of all the aviation fuel consumed in that country, while the airlines consume 69 per cent, military aviation accounting for the rest. As a result, current fuel shortages are not likely to be a serious constraint upon the growth of business aviation, although shortages are occurring and will continue to do so.

## Faster

In fact, top officials of the U.S. General Aviation Manufacturers' Association believe that business aircraft deliveries will continue at a steady rate, and may even rise at a faster rate than in the recent past. Piper, one of the "Big Three" manufacturers (the others being Cessna and Beech) in the U.S. says: "Our sales indicate that, every year, more and more businessmen are electing to add a general aviation aircraft to their list of business tools."

In terms of numbers, this indicates that by the late 1980s, the world inventory of general aviation aircraft could be in the region of 300,000 aircraft, of which turbine-powered aircraft, mostly for business use, could number 12,000 to 15,000. While the U.S. manufacturers will continue to dominate the scene, the other manufacturers will also expand. British Aerospace with its 135 series of business jets, Aerospatiale and Dassault-Breguet in France, Israel Aircraft Industries Embraer of Brazil and Mitsubishi of Japan, to name but a few of the growing band of business aircraft manufacturers.

The number of different types of aircraft available to the businessman or company is vast—more than 100 models of all kinds are available, ranging from single-engine two-seaters up to multi-engine "flying boardrooms," both turbo-propeller or jet powered. While the initial cost in black-and-white on paper may appear to be prohibitive, and the operating cost perhaps frightening, careful examination of the overall costs of all business travel by a particular company will



The U.S.-built Beechcraft King Air is a typical example of a twin-engine cabin monoplane used extensively by companies for the transport of executives in the U.S., Western Europe and elsewhere.

often show that it is cheaper in the long run to invest in a corporate aircraft than to go on paying large sums in scheduled air fares and overnight hotel and meal costs.

The secret is to ensure that the corporate aircraft is just that—available for use by everybody in the company who has a genuine reason to use it, whether it be to fly out to sign a contract or to carry spare parts urgently needed somewhere down the line. The big mistake is to buy an aircraft for prestige, or for use as a "chairman's toy."

The second mistake is to buy the wrong type of aircraft. Finding the right kind of aircraft is essentially a task for the specialist—the aircraft broker or aviation consultant who is able to prepare a detailed cost-benefit analysis of the company's aviation activities in the course of any one year, and relate it to the type of aircraft best suited to the

would-be purchaser's requirements.

Most emphatically, buying a corporate aircraft is not "just like buying a company car"—the knowledge required is highly specialised, and a few hundred pounds spent on an initial specialist adviser's fee is often the means of saving many thousands of pounds over the ensuing years. Many such specialists exist in the U.K.—their names can be found in the advertisement columns of the specialist aeronautical journals every week.

There are also the bigger specialist organisations, such

as the Business Aircraft Users' Association and the General Aviation Manufacturers' and Traders' Association in the U.K., both of whom are ready and willing to help would-be business aircraft buyers and fliers on finding the best aircraft for them, and on how to gain such benefits as tax reliefs on their investment, as well as how to find crews, maintenance and engineering facilities, and other operational data.

For the would-be business aviator who does not want to buy his own aircraft, the Air Taxi Operators' Association, which has more than 40

members, is available to advise on the hiring of aircraft of all kinds for ad hoc operations, while the British Helicopter Advisory Board performs a similar service for those interested in rotary-winged aircraft.

A few days or weeks spent in this kind of preliminary analysis and discussion can ensure that the newcomer to business aviation remains a happy and profitable aviator, and does not become an unhappy, disgruntled and disillusioned experimenter who is out of pocket. It is a constant source of wonderment to many

in aviation that some businessmen or companies move into aviation without adequate preliminary analysis, and are obliged to quit in dismay.

On the other hand, the disillusioned are heavily outnumbered by those who, having studied their needs carefully, with the proper advice, have made the right choice, and have discovered that the aeroplane is not only a useful tool of management, but also a source of profitable growth into wider physical and commercial horizons.

M.D.

# Mixed fortunes for the pleasure flier

THIS YEAR has been one of mixed fortunes for the pleasure fliers of Europe. Rising fuel costs look set to hit their pockets at a time when the price of new light aircraft shows few signs of levelling-off.

However, such developments may be offset by an equally rising tide of competitiveness among manufacturers as they take advantage of new equipment, new production techniques and licensed production away from the home base.

Perhaps the best example of this came earlier this year. Short Brothers, the Belfast-based aerospace company, signed an agreement in April with the Piper Aircraft Corporation of Pennsylvania in the U.S. for the production in Northern Ireland of the Tomahawk light trainer aircraft. The move is certain to give a major boost to light aviation in Britain and on the Continent, where light aircraft production has consistently lagged behind the U.S. with its vast distances and ready market.

The development is an important landmark for Short Brothers, as the new venture marks the successful conclusion of the company's second bid to enter the light aircraft production business.

The company attempted to acquire the Britten-Norman (Bembridge) company and the Islander and Trislander aircraft assets of the Fairey Group in August 1977. The bid was rejected by the Fairey receiver three months later, and the assets were taken over by the Swiss Pilatus aircraft company last year. But now that production of the Tomahawk in Belfast is assured, sports and leisure fliers stand to benefit from the local output almost immediately.

The aircraft has been an enormous success in the U.S. Sales topped 1,400 in the first 15 months of production and when production starts in Belfast later this summer, the aircraft stands to attract the same level of enthusiasm in Europe.

Tomahawks have already been sold in Europe through the CSE Aviation organisation. The company assembled the aircraft after they had been completed, certified and then disassembled in the U.S. for shipping. But two aircraft in their semi-assembled form were all that could be squeezed into a standard shipboard container. Under the agreement with Short Brothers, Shorts will bring in all the parts needed for 10 complete Tomahawks—about a month's production—in a single container.

These will then be assembled at the Belfast factory. The production savings from

the increased efficiency of freightage are expected to be up to £1,000 per aircraft which sells for around £3,000 at the moment.

How much of this will be passed to the customer remains a matter for Shorts and for the sales agents. But both companies are confident that the Tomahawk will become a familiar sight on the flying fields of Europe, in close competition with the Cessna 152, thought to be one of the Piper aircraft's main competitors.

Cessna has a very impressive range of light and general aviation aircraft. Its current range includes 34 basic models from the competitively priced Cessna 152 at around the £2,500 price level, to the £1.7m long-range version of the Citation III.

The aircraft are designed for sports, general aviation duties, passenger transit and business use. The company is tackled in the sports flying arena by other major U.S. companies, in particular Beechcraft, which offers 17 general aviation aircraft ranging from the £17,000 Beechcraft Sundowner 180, to the £110,000 King Air B30. Many of the aircraft at the higher end of the price spectrum are designed with an eye on the needs of the business traveller and sales to companies account for a high proportion of business.

## Efforts

Piper Aircraft Corporation has tended to concentrate its efforts on light aviation aircraft, although at the end of its range of 24 aircraft opposite the Tomahawk its boasts the £317,000 Cheyenne II for luxury business use.

The continued domination of the world's light aircraft industry by companies from the U.S. looks set to prevail throughout the 1980s. There is a growing challenge, however, from Europe, in particular from the French Aerospatiale company.

Aerospatiale offers 11 light and general aviation aircraft, again with an emphasis on business and executive transport at the higher price ranges up to £1.2m. At the other end of the price scale, the Rallye series of six aircraft has a wide appeal, particularly to flying clubs, wealthy individuals or fliers who make up for lack of money with enthusiasm.

But even the greatest enthusiasm for private flying must be expected to take a knock from the rises in the price of aviation fuel which have accompanied the general increase in oil prices this year. Transport users, aviators included, have been hit twice, or will be if the Transport Department's proposal to abolish excise duties on

vehicles is enacted with the accompanying rise in tax on petrol, regardless of the form of transport involved.

The British General Aviation Manufacturers' and Traders' Association has been active, since the proposals were announced last year, in seeking changes which would exempt aviation from the petrol tax increases.

The increase may be around 20p per gallon of aviation fuel and although the idea is still just a proposal and may be changed by the new Government, the prospect has grieved the aviators to review current fuel consumption.

The association produced a seven page document analysing consumption and has suggested that the new tax would add an extra £3,000 a year to the operation of each of Britain's 330 piston-engined air taxis.

Britain's fleet of 130 light aircraft for agriculture use would pay an average of another £1,200 a year and helicopters for a similar role would pay another £1,650 a year. The tax would also have a direct bearing on the costs of learning to fly. The association has put the extra cost of obtaining a commercial pilot's licence on an approved course at £500. Britain's 20,000 qualified private pilots would feel the effects and the rise in the costs of training would hit the 180 flying clubs currently training up to 5,000 students a year.

But the growing band of fliers who take to the air for pleasure should take heart, for there are other ways of enjoying flight without the penalties of high fuel costs.

In Britain as many as 50,000 people fly for fun, in powered aircraft, in gliders, slung under hang-gliders, or suspended in hot air or helium balloons. Fear of the cost rather than fear of flying has traditionally put many people off flying and yet the costs may be comparable to other sports, such as sailing or even car ownership.

Gliding can lay claim to be the most elegant alternative to powered flight. The sport is growing at a steady 6 per cent per annum, according to the British Gliding Association. Gliding is equally popular in Europe, with West Germany and France regular competitors in international gliding contests. The sport is now so popular in the South East of England that clubs have waiting lists. One factor is the shortage of land suitable for gliding operations. This needs to be under airspace cleared for gliding and as civil aviation becomes ever more popular new glider airfields have proved almost impossible to come by.

Over half of Britain's 100 gliding clubs offer week-long holiday courses for would-be

pilots. It requires about 50 launches for the student to gain the experience needed to go solo and at around £5 an hour the total price is highly competitive with other sports.

But like other sports, particularly sailing, there are essential extras, including helmets, clothing and boots, which add to the cost.

Similar extras are needed for the growing sport of hang-gliding. The British Hang-Gliding Association, based in Somerset, estimates that there are now 5,000 adherents to the sport in Britain. In the U.S. the sport is almost commonplace and is no longer treated as a dangerous oddity. Nevertheless the risks for the badly trained flier must still be regarded as high.

There were a quarter of a million hang-glider flights recorded by the Association in Britain last year. Five people died in hang-gliding accidents compared with two in 1977.

## Tests

The world hang-gliding championships are to be held at Grenoble, France, this year. Tests will include 360 degree turns and landing accuracy tests. The best distance covered so far in competition hang-gliding is 12½ miles achieved during a flight in Scotland, so the standard of competition can be expected to be high.

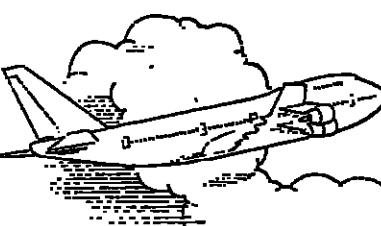
Success in the world championships could bring prestige and worldwide sales to the 13 British hang-glider makers, but there is tough competition in a world market worth £50m a year.

The low cost—less than £500—of hang gliding points to personal ownership of the fragile craft. Not so hot air ballooning, where syndicate ownership is almost a must for financial and practical reasons.

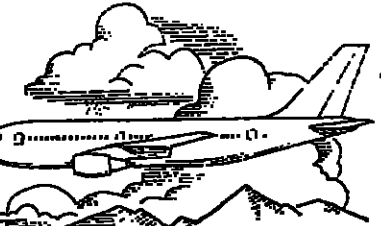
The balloons cannot be inflated without assistance and as the British Balloon and Airship Club tells prospective balloonists, like-minded enthusiasts aside from the thrill of the sport, all balloon pilots in Britain are licensed by the Civil Aviation Authority. The balloons cost from £1,750 for one suitable for duration flying.

Cameron Balloons of Bristol and Thunder Balloons of London are Britain's two makers. Operating costs are so variable that aside from the propane fuel—costing up to 10p a pound, for the 90 pounds needed for a short flight, total costs are difficult to quantify. The thrill of the sport, however, is such that there are about 150 qualified balloon pilots in Britain, with untold numbers of willing helpers.

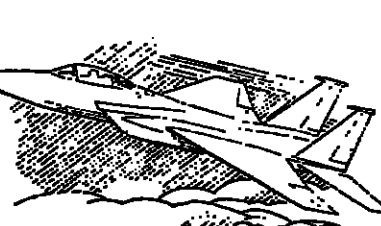
L. McL.



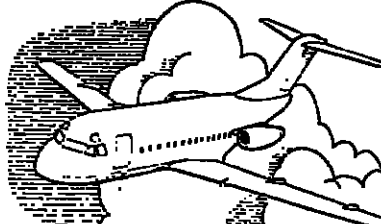
**When Boeing builds wide-body transports, Hexcel sells composite materials.**



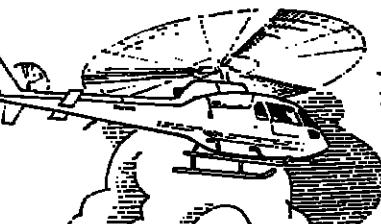
**When Airbus Industrie builds airplanes in Europe, Hexcel sells composite materials.**



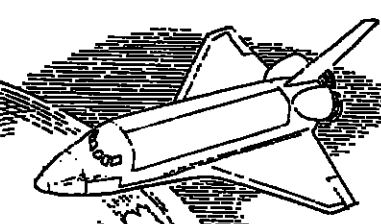
**When McDonnell Douglas builds tactical fighters, Hexcel sells composite materials.**




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الطيران



# Airships ready to make a comeback

A time when aviation fuel prices are being squeezed, and prices are being squeezed, there are many in the aerospace industry who believe the time is ripe for a comeback of the airship.

This type of aircraft has been used for more than 40 years—certainly since the World War II. It was almost killed off by the disasters in the 1930s—most notably that to the German dirigible, the Hindenburg, which was destroyed by fire while landing in Lakehurst, New Jersey, in May 1937.

Slackening of public interest was accelerated by the loss of large numbers of fixed-wing aeroplanes for immediate transport and combat, requiring substantial and installations to support them.

As a result it is sometimes even that in the period between the two World Wars, airship achieved a notable record of passenger transport, especially across the North Atlantic. But because of the receding development of fixed-wing aeroplanes in the post-war period, leading to a post-war emphasis on type of craft for passenger transport, interest in the airship ed, except in the minds and of a handful of enthusiasts who have struggled to keep the concept alive.

## ream

ut today, as the cost of fuel soars, and as the complexities of ground infrastructures also rise, bringing in a train of increasing demands for bigger airports and terminal facilities, the long-dormant idea of an aircraft that is cheap, pollution-free and paratively undemanding in requirements may well be n unexpectedly a new lease of life.

or undoubtedly, the airship many advantages. As technology moves on, so many of factors which years ago led to the collapse of interest in the ship have been overtaken by time, so that today they are no longer problems.

First, the old emphasis on hydrogen as a means of filling

the gas-bags has given way to the use of non-flammable helium, so that the safety factor in airship operation has improved enormously. Secondly, the airship, despite its bulk, does not require anything like the same power output from its engines as a fixed-wing aircraft to propel itself through the air. In most instances of modern airship design, the power-plants are comparatively simple motor-car or other types of piston engines, using a limited amount of fuel and making a correspondingly limited amount of noise—hence their greater environmental acceptability.

Thirdly, there is almost no limit to the size that airships can be built—an airship capable of carrying as many passengers as a jumbo jet is technologically feasible. What is lacking at present is the cash with which to undertake the design, development and production of such craft.

Basically, an airship is a lighter-than-air craft, usually powered and "dirigible," that is capable of being steered. It is also usually (but not always) "rigid"—that is, either having a skeleton structure of light metal covered with fabric of some kind, or in today's engineering terms a stiff outer casing of carbon-fibre composites with aluminium or other metal supports if needed. Non-rigid airships, that is non-steerable, airships (such as the Barrage Balloons of World War II) are of no use for transport purposes, being little more than floating and tethered devices. Similarly, non-rigid airships, while perhaps capable of carrying a few passengers, have size limitations and thus limited commercial significance beyond perhaps aerial TV platforms or for advertising purposes.

But the big lifting capacity of the dirigible, rigid airship comes from the substantial space within its hull that can be filled with a lighter-than-air gas, such as helium, which is not only non-flammable (and therefore much safer) but also non-toxic and odourless. Whereas at one time helium was expensive to obtain, today, as a result of techniques evolved to produce it swiftly and comparatively cheaply in large quantities, for example, in the U.S. space programme and for industrial uses, it has become a

much more suitable gas for potential airship designers to consider.

The dirigible airship, either rigid or non-rigid, filled with helium, and powered with a number of petrol or diesel-fuelled engines to give cruising speeds of up to 120 mph or so, has become a much more feasible possibility in recent years, and throughout the world more and more designers have turned their attention to it. The aerodynamic shape of the airship is not suitable for the high speeds attainable by fixed-wing aeroplanes, and it is therefore highly unlikely that there will ever be airships that can compete directly in speed with today's jet airliners. But there are many who believe that there is still a role for the big cargo airship, capable of travelling slowly but steadily through all but the very worst weather conditions over very long distances, carrying substantial payloads.

Even in terms of passenger transport, there may be many who would prefer to spend much longer on their air journeys provided they could be guaranteed the kind of comfort that the large cabins of airships could provide. For example, one only has to look at the pictures of the almost elegant way of life that passengers could lead in the big transatlantic airships of the inter-war years—beds, lounges, promenade decks, and saloons and dining rooms—to realise just what air travel has lost as a result of today's pressures towards greater speed, in cramped cylinders of metal that sacrifice comfort in return for economic convenience.

This much lower speed of the airship has often been cited as a disadvantage compared to the 600 mph or so of the big jets. But because of the vast size of the airship's envelope, giving almost unlimited fuel-carrying capacities, the airship's range in turn is virtually unlimited, whereas that of the jet airliner is strictly circumscribed by the volume of fuel that it can carry. Thus, the airship is able to travel non-stop for much longer distances, whereas the fixed-wing jet airliner must land to refuel.

Furthermore, in terms of the ground infrastructure required, the dirigible airship also

does not need a concrete runway nearly two miles long to get off from, or onto, the ground. Certainly, it needs a mooring mast, and a terminal building with all the facilities that fixed-wing airport terminal buildings may have, and special loading facilities, and it probably also needs some kind of large hangar of "shed" in which it can be overhauled and housed when not in use. It also needs, in today's increasingly congested sites, the air-traffic control facilities that fixed-wing aircraft need when coming into land or taking off from busy airports close to city centres.

## Control

But airships also have an advantage in that they do not fly so high as fixed-wing jets. In many instances their operational area is well below that of the jet airliner, so that they are clear of much other air traffic, except in the vicinities of major airports, thereby to some extent easing the air-traffic control task.

All of this adds up to the fact that the airship is a concept that is well worth reconsidering seriously for the future. From a technical point of view, many of the world's most famous aeronautical designers have in recent years turned their attention to the airship, applying today's advanced aeronautical techniques to the design and development problems that forty years ago seemed to be insuperable. The development of new, high strength-to-weight composite materials, new techniques of fabrication and new knowledge of fatigue in structures, have revolutionised airship design, and there are few aeronautical designers today who would deny the technological feasibility of airship design, development and production.

The whole concept, however, still has to pass the acid test of economic viability. So far, the emphasis has been on proving the technology, and far too little work has been done in the region of cost-effectiveness. While most of the studies done so far appear to indicate that mass cargo transport by airship could be a profitable proposition so far no-one has been able to prove the point with a regular commercial service.

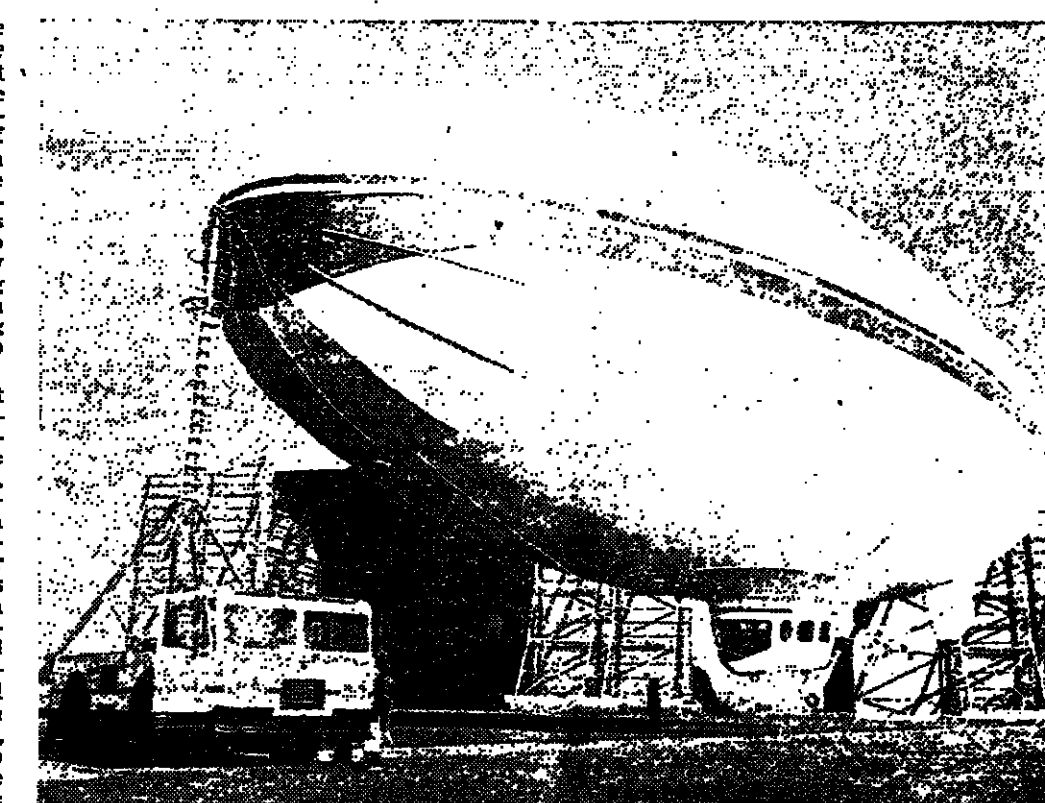
The airship also has to over-

come to some extent the hurdle of novelty. While before the Second World War the concept was widely known to the public at large, albeit somewhat tarnished in image as a result of well-publicised accidents (such as to the Hindenburg and the UK R-101), there are now post-war generations to whom it is something unusual. The airship also has to face the undoubtedly strong lobby from the fixed-wing aircraft manufacturers, who can see their strongholds being eroded by widespread airship development.

But the airship is not without its growing band of protagonists. In the UK, a private-venture company, Aerospace Developments, has designed, and built, the prototype non-rigid AD-500 which made a successful maiden flight at Cardington, Bedfordshire, earlier this year. The prototype has been built under contract to a Venezuelan company, Aerovision, which has also placed an order for a further 20 airships. The Royal Navy will conduct a two-month evaluation programme with the AD-500, while the US Navy is also interested. The designers believe that a substantial market exists for this type of craft over the years ahead.

The AD-500 is powered by two Porsche three-litre 180-hp engines which, developing full power, can give the AD-500 a maximum speed of 62 knots, while also being exceptionally quiet—at 300 feet the airship is virtually inaudible from the ground. The airship's envelope is made of polyurethane-coated polyester with a layer of titanium dioxide, and it is filled with helium. The maximum payload is 2½ tons. The gondola beneath the craft can carry up to 14 passengers. The uses envisaged include defence work, coastal patrol, surveying, freight carrying, aerial advertising and sightseeing work.

Other UK companies interested in airships include Airfloat Transport and Thermoskylships. Other airship developments currently under way include ventures in Australia, Japan, the Soviet Union and the U.S. In the latter country Goodyear Aerospace Corporation has been one of the world's greatest builders of airships, with a record of more than 300 craft over



The UK Aerospace Developments AD-500, which made its maiden flight at Cardington, Bedfordshire, earlier this year.

the past 70 years. The company today owns and operates the world's only existing fleet of airships—the Europa, which tours the UK and Western Europe each summer, and three similar craft in the U.S. itself.

Recently, in testimony to the U.S. Senate sub-committee on Science, Technology and Space, Mr. Morris B. Jobe, president of Goodyear Aerospace, said that airships with helicopter-type rotors could lift up to 160 tons, almost the weight of a fully-loaded Boeing 707, and serve a variety of industries. Such vehicles were within the scope of existing technology, but the primary problem was the lack of funds to proceed "in an immature and emerging market."

Mr. Jobe said that heavy-lift airships could aid in reducing port congestion by loading ships away from docks, help fight forest fires and transport a variety of equipment for pre-fabricated structures, off-shore

drilling platforms, high-rise buildings and bridges.

"No breakthroughs are needed, therefore basic research is neither required nor desired," he said, although some of the technology needed to be developed from existing designs produced by Goodyear.

Quietly, therefore, throughout the world, much work is being put into airship design, and there are few who really doubt that, technologically, the concept is fully feasible. If the economic case for the airship can also be demonstrated substantively in the years immediately ahead, it may well be that the world's aerospace industries will have at least one alternative answer to the growing problems of fuel shortages and soaring fuel bills, and the time may well yet come when these elegant, silent, silver shapes are once again seen in profusion in the skies.

M.D.

## FINANCIAL TIMES SURVEYS

# AVIATION & DEFENCE



- 1 August SATELLITES**  
The emphasis in space research is away from the glamorous spectacles and more towards getting value for money—putting space to work.
- 23 August AERO ENGINES & INDUSTRIAL GAS TURBINES**  
The role of the gas turbine in aerospace and in land-based applications—the coming surge in orders as airline re-equipment gathers pace—the prospects for the gas turbine in industrial applications—profiles of leading companies—main industrial markets—component suppliers—technical developments.
- 5 September BUSINESS AVIATION**  
Just before the Cranfield Business and Light Aircraft show, this survey will discuss the growing business use of light aircraft—what the scheduled airlines are doing to retain business traffic—types of aircraft and the cost of buying and running them—specialist organisations—air taxis and air charter.
- 24 October DEFENCE EQUIPMENT INDUSTRY**  
The massive back-up operation by equipment, component and ancillary suppliers which is behind the major defence contracts—the increasing interest by third world countries in buying major arms and in developing their own defence industries—defence equipment suppliers in W. Europe and the U.S.
- 8 November LONDON AIRPORTS**  
The great debate on the future of airports in London and the South East may have reached some conclusion by November, but much discussion will remain.

For further information please contact:

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Financial Times, Bracken House, 10 Cannon Street, London EC4P 4BY  
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## Hellenic Aerospace Industry

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- Induction of first aircraft workload: 1978
- Induction of first engine workload: 1979
- Facility construction scheduled completion: 1979
- Full production operations: 1980
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AEROSPACE XII

FRANCE

Healthier atmosphere

FOR YEARS the financial dead-weight of the Concorde programme has hung over the French aerospace industry...

Two factors are mainly responsible for this change in the atmosphere—the dramatic success of the Toulouse-manufactured Airbus during the last 18 months...

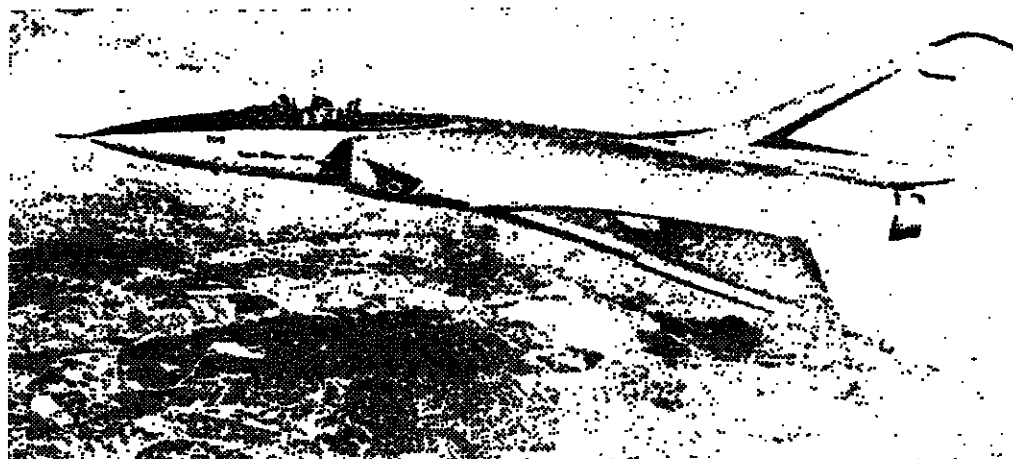
The success of the Airbus has been the most eye-catching since it has happened so quickly. The first aircraft in the range were delivered to Air France in 1974...

The emergence of the Airbus as a competitor to the Boeing range of medium-distance airliners clearly has been enough to convince the UK Government...

This contract was an extremely important psychological breakthrough, partly because Eastern owns the second largest fleet in the world...

The financial success of the Airbus is still by no means assured. The A-300 has cost about FF 4.4bn (\$1bn) to develop...

It is clearly going to take



The Mirage 4000 is the latest supersonic multi-role combat aircraft to emerge from Arions Marcel Dassault-Breguet Aviation of France...

several more years before this objective is achieved. At the moment rather less than 3 aircraft are being made a month...

This change has led to a financial reorganisation of the consortium. Equity is now split between four partners—British Aerospace (20 per cent), Aerospatiale, the French nationalised company (37.9 per cent), Deutsche Airbus, jointly owned by Messerschmitt-Bölkow-Blohm and VFW-Fokker (37.9 per cent) and CASA of Spain (4.2 per cent)...

So far as France is concerned, the most immediate benefit from the Airbus programme is being felt in terms of overseas earnings (although this must be balanced against the fact that many parts are sub-assembled by other members of the consortium)...

At the same time, however, Aerospatiale is beginning to come out of a long tunnel of poor results. After seven years of losses it managed a substantial turnaround last year which

has led to tentative forecasts of a profit in 1979. Business increased significantly last year—from a turnover of FF 8.5bn in 1977 to FF 10bn—and is expected to go up even more sharply in 1979...

The larger part of this improvement was due to the company's missile division. But the longer term prospects are equally dependent on an upswing in the aircraft section...

Gestation

In the aircraft engine sector of the French aerospace industry, SNECMA has enjoyed a more stable financial record than Aerospatiale. But in its latest engine development, the CFM-56, a joint project with General Electric of the U.S., it has had to endure a similarly long gestation period...

jets. Since then sales have mounted quickly to about 30 engines at the present moment.

This order book will bring SNECMA a potential FF 1.8bn in earnings against an estimated development cost of about FF 2bn. But there should be more orders on the way...

The breakthrough of CFM-56 in world markets, which fills a gap for engines of tonnes thrust, will also improve SNECMA's financial position. Although the results have not yet been analysed, the company made healthy profit of FF 70 after tax and charges in 1978...

This programme is looking a range of engines—the CFM56 with thrust of between 10-25 tonnes. It also has a family of military engines under development—the M-53 and L-38, a co-operative venture with Turbomeca.

Given the Aerospatiale-SNECMA activities, plus continuing success of Dassault group with its range of military and executive aircraft, the French aerospace industry is probably in a better shape today than at any time during the decade...

Terry Dodswell

WEST GERMANY

Rejoicing over Airbus

THE DOMINANT event of the last 12 months for the West German aerospace industry, as for those of its partners, has been the enormous success of the European Airbus programme...

For executives and engineers in the West German industry, who have always had excellent personal and working relationships with their British counterparts, it was an additional source of satisfaction that the first meeting of the enlarged Board of Airbus Industrie should have been held last January in Ottobrunn, near Munich...

It is not only Anglophilia, however, that gives the Germans such satisfaction in the success of Airbus. The programme is already pushing hard into the market for wide-bodied airliners that the American giants previously had to themselves...

That is a matter which is not yet being openly talked about, yet it is already clear to the West German Economics Ministry that the Airbus programme fulfils its chief criterion for making investments in aerospace projects—that they should turn out aircraft the market wants to buy...

order books and employment prospects are brighter than they have been for several years, and certainly much better than at the painful moment in late 1977 when VFW-Fokker was forced by Bonn to abandon its short-haul jet airliner, the VFW-614...

Should the Airbus order books ever swell to the point where governments were prepared to underwrite a second production line, North Germany could be relied on to make a strong case for being given it.

That the North German aerospace industry should now be in so much healthier a position—to the point that even in Bremen, with its chronic unemployment problems, skilled men are in short supply—is naturally gratifying both to the State Governments, which are now deeply involved, and to the unions...

Besides Airbus Industrie, MBB is also a partner in the highly successful Euromissile consortium which produces the Milan, HOT and Roland weapons systems. Not least, it has built on its experience with the widely-sold BO-105 helicopter to enter new joint helicopter developments with both France and Japan.

The next challenge for MBB is already on the horizon, or even nearer. This is the so-called tactical combat aircraft for the 1990s, or TKF-90. Still in a phase of definition by air staffs and governments, the project could mark a new phase of co-operation among European aerospace industries...

Should Herr Gruener choose to make more active use of his powers of coercion (through his

control of funds for Airbus and other programmes under his control), VFW-Fokker would be in little position to resist. It is already on a tight financial leash as a result of the terms on which Bonn came to its rescue at the time of the VFW-614 cancellation.

For MBB, the main emphasis for a decade and more has been to spread itself into as many international co-operative programmes as possible. Thus it is the German partner in the British-German-Italian Tornado Multi-Role Combat Aircraft programme, co-ordinated by the Panavia consortium, whose former chief executive, Herr Gero Madelung, is now chairman of MBB itself.

Yet until the MBB-VFW merger is completed, there continue to be a sense of uneasiness and distraction in German aerospace industry. delay appears to be the result of the managements of two companies than of 10 shareholders.

Presence

Here, matters have been considerably more complex by the financial presence of fewer than three State Governments—Bavaria and Hamburg between them have 43 per cent of MBB, while Bremen last year bought control of a hold company that owns 26.4 per cent of VFW. The States have bought in because each feel needs a say when, inevitably, talking about the closure of more marginal plants.

It seems unlikely, however that any of the big industrial groups which make up the remainder of the sharehold of each company will react consent to give up its own say on the Board of the company—indeed one of the Krupp, is believed to be negotiating to raise its stake in VFW to make certain this does occur.

Another complicating factor is the attitude of the DFL-Fokker shareholders who, thought in Germany to be reconsidering whether (as they generally assumed up to now) they really wish to along with the breaking up of the transnational group, in that Fokker appears to have prospects on its own.

Adrian Didi



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Twenty Years on Personality Profiles

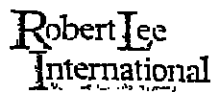
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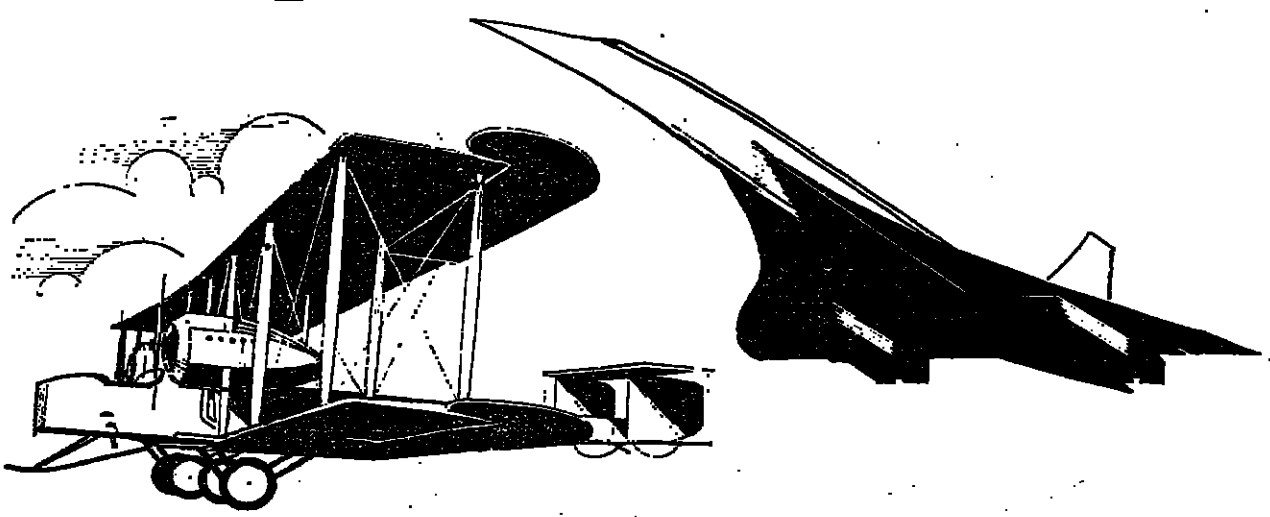
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AEROSPACE XIII

UNITED STATES

ere Heady days as defence outlays rise

ESE ARE comparatively dry days for the U.S. Aerospace industry. President Carter promised to increase defence spending by 3 per cent a year...

But the U.S. Government remains by far the industry's largest customer and accounted for 71.5 per cent of last year's total sales of \$37.3bn...

Military equipment sales for the next three years look promising according to Mr. Edmund Greenstein, aerospace analyst with Merrill Lynch.

But many military equipment companies are expecting good business from other sources as well as the U.S. Government. The Egyptian-Israeli treaty could bring sizeable orders to the industry because of the U.S. Government's promise of large amounts of aid to modernise the two countries' defence forces.

Japan's military budget has increased 5.5 per cent a year, after adjusting for inflation since 1977. Japan is buying some McDonnell Douglas F-15 fighters and Lockheed PC-9 anti-submarine aircraft...

Lockheed warned in April that these increased costs "will defer the point at which L-1011 production is expected to reach break-even on a current basis."

TriStar year since 1968, and left the company with 30 unfilled orders at the end of December. In the first quarter of this year, however, only one order was booked and clearly Lockheed has a major marketing job to do...

As expected, McDonnell Douglas failed last year to match the record intake of 128 new orders established in 1977. Encouraged, however, by the obvious strength of the world market, the company like Lockheed has accelerated its production rate...

Lockheed's sales of \$249m were at their lowest level in the aircraft's seven-year history and accumulated losses on the programme since 1974 climbed to \$508m.

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Boeing's order book had climbed from \$11.16bn to \$14.66bn in just three months largely because of new orders which by the end of May amounted to 95 727, 737 and 747 jets.

By the end of May, however, Boeing had not captured any more new orders for its "new generation" of 737 and 767 aircraft to add to the 40 737 and 84 767 contracts taken last year.

SOVIET UNION

Successes and failures

RHAPSODY is because the fast aerospace industry is so small, and its successes so much mark of national pride, that failures and shortcomings receive attention.

The Soviet air fleet remains of the two largest and most sophisticated in the world. It also, arguably, the most vital. Air travel is the only that the vast distances in Soviet Union can be overcome.

The Soviet Government tried to buy engines for the IL-86 from General Electric in the U.S. and Rolls-Royce in Britain but the U.S. Government blocked the GE sale and Rolls-Royce has also turned the Soviet Union down.

Mr. Ivan Razumovsky, the Deputy Soviet Minister of Civil Aviation, said that the IL-86 will start on Soviet routes by the end of the year, but Western experts are treating this claim very sceptically.

The most promising of the new Soviet aircraft which were to be introduced into service during the present 1976-80 Five-Year Plan period was the Yak-42, a 120-seat aircraft which can land on the rough ground of a Siberian airstrip and has special navigation equipment to simplify control and make it possible to fly in difficult weather.

Unlike the larger aircraft, the Yak-42 has shown no evidence of technical shortcomings but it also has yet to be introduced into service. The most likely explanation is that older aircraft, such as the TU-104, the TU-124 and the IL-18, which were to have been phased out, are proving more durable than had been expected.

Soviet officials have said that the TU-144 and the IL-86 are destined to become the mainstays of the Soviet civil fleet, but the problems that have been experienced with both of them are serious and apparently stem from the more basic weaknesses of Soviet large engine design.

flight frequency and relieve a lot of frustration by giving passengers a better chance of taking off on time. The aircraft has been making experimental flights on routes between Moscow and the southern resort towns of Mineralnye Vody and Sochi, but these flights are preliminary route planning exercises and not necessarily a prelude to the inauguration of passenger service.

The IL-86 flies virtually empty on these experimental flights so they in fact prove very little. The problem with the aircraft has always been underpowered engines. With high density loading the IL-86 could have the capacity to carry 400 passengers but it now appears that the Soviet Union does not have an engine able to supply this kind of mass transport.

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David Satter Moscow Correspondent

Cushion

Government business accounts for 77 per cent of McDonnell Douglas's sales and 57 per cent of Lockheed's. This obviously provides an important cushion for both companies against problems with their commercial aircraft production, which in Lockheed's case have been particu-

Advertisement for British Aerospace featuring a stylized logo and the text: 'unequaled in its range of aerospace programmes', 'We are good collaborators...', 'Did you know that British Aerospace has more experience in international industrial collaboration than any other aerospace group in the world?', '...and profitable', 'BRITISH AEROSPACE Weybridge, Surrey.'



AEROSPACE XIV

THE NETHERLANDS

Decisions awaited



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The EF-111A—the world's newest tactical supersonic ECM aircraft. In these three alone you have an electronics air force. Grumman International, Inc., Bethpage, Long Island, New York 11714, U.S.A.



The reliable source

THE DUTCH aircraft industry—in the shape of the aerospace group Fokker—has come through a difficult year but it now has a much clearer view of the future. The company's revitalised management is carrying out an internal reorganisation to improve its planning. A decision has yet to be taken on whether to go ahead with a new 115-130-seat jet airliner, the F-28 Super, but progress has been made on defining the type of aircraft the market wants. Meanwhile, demand for the F-27 is strong, while the Airbus A-300, in which Fokker has a stake of just under 7 per cent, is capturing new markets. The impact of the Dutch Government's decision to order Lockheed Orions in place of the French Breguet Atlantique for marine reconnaissance work has been less than Fokker first feared—or claimed to fear. Fences are now being mended with France. The breakup of the 11-year-old merger with the West German VFW group remains a major uncertainty though, and there is no immediate prospect of a solution.

Support

A decision is still awaited from the Dutch Government on whether it will support Fokker's participation in the A-310 version of the Airbus. Fokker is a subcontractor to the A-300 project but hopes to take a risk-sharing stake of just under 2 per cent in the new aircraft—making the fairings and wheel doors. Although it is very positive about the Airbus project Fokker is not prepared to extend its involvement unless it has guarantees that the Dutch Government will compensate it for the loss it expects to make. Its participation in the A-300 is also loss-making, but unlike Spain, France and West Germany, the Dutch Government has not provided compensation for the contract drawn up at now unrealistic dollar prices. Fokker is coy about revealing its own losses on the A-300 Airbus but says they are "peanuts" compared with the DM10m it estimates the West German Government puts up in subsidies for each aircraft for the German industry's share in the deal. The Dutch Govern-

ment is in favour of European aerospace co-operation—the Economics Ministry's Budget memorandum recognised that aircraft manufacture is a high-value activity providing high-value jobs with a spin-off effect—but it has yet to decide on support. Ironically the recent success of the Airbus models has made more pressing the problems of Fokker's losses—the more aircraft sold the further it is pushed into the red.

A major stumbling block in the Airbus talks is the demand that Fokker should not develop any aircraft which would compete with one produced by the consortium. This would clearly prevent the Dutch concern developing the F-28 Super. Alternatively Fokker should bring the F-28 Super into the Airbus project.

Neither of these demands is compatible with Fokker's aim of maintaining an independent capacity to design, build and market its own aircraft. "Faced with the choice of giving in to these demands or not joining the A-310 project we would opt to stay out," said Fokker's public relations manager, Mr. Nol van Fenema.

Fokker is hopeful that the Airbus group will climb down though. Fokker expects to have a fair idea of what its new F-28 Super will look like by the middle of this year. Talks with potential foreign partners have gone better than the company expected and there are hopes that these partners will put up more than the 50 per cent of the FI 1bn (\$480m) cost than was initially thought. This would clearly be welcome to the Government, which is already faced with making public spending cuts and with demands for funds from a number of recession-hit industries.

Fokker reports interest in the U.S. from the major aircraft companies such as Boeing, Lockheed, General Dynamics and Northrop for the F-28 Super. McDonnell Douglas has been taken off the list of possible partners though. The Dutch company is looking for a limited number of risk-bearing partners, as well as several subcontractors. European concerns which are being considered in this role in-

clude Saab, Dornier and Aeritalia.

The interest of the F-28 Super for a company such as Boeing lies in the prospect of a smaller aircraft to replace the 737—which might otherwise require costly new engines and wings. The Japanese are unlikely to come in as risk-bearing partners but may become sub-contractors.

Change

Fokker's decision to seek out partners in the U.S. and Japan as well as in Europe marks a fundamental change under the chairmanship of Mr. Frans Swartouw. He has thrown overboard the exclusively European attitudes of his predecessor, Mr. Gerrit Klapwijk, who stepped down last year. "The thinking used to be that Europe could teach the Americans a lesson. We now realise we can forget that," Mr. van Fenema remarked.

Meanwhile the faithful turbo-prop F-27, which has been on the market for 20 years now, continues to surprise its makers. Thirteen of the aircraft have been sold already this year compared with 11 in the whole of 1978. Fokker hopes to announce shortly an order for three from a U.S. commuter airline—its first order ever from a U.S. airline and a sign that even the sophisticated U.S. market offers possibilities for the F-27. Up to now this aircraft has tended to appeal mainly to military users and the airlines of developing countries.

Unless Holland ordered Dassault's Atlantique to replace the ageing Lockheed Neptunes for marine reconnaissance work French co-operation on a number of deals would be withdrawn. Fokker was forecasting last year. Mr. Swartouw even went so far as to claim the company's future as an independent aircraft maker would be threatened. Despite intensive lobbying by Fokker the Dutch Government chose the Lockheed Orion—and Fokker has survived.

The Orion decision did lead to an immediate halt to negotiations over an order from France for up to 18 maritime versions of the F-27. There are signs that French anger at being passed

over a second time—Hollan earlier opted for the F-7 fighter at the expense of Mirage aircraft—is lessening. Contacts have been resumed on the F-27 order.

Prospects for French operation on the F-28 Super appear small, though, particularly as the issue is complicated by the fact that this aircraft might compete with an Airbus consortium project. If, however, market research shows it need for a larger engine for the F-28 Super than the Rolls-Royce RB-432 now planned, the U.S. French Smeeta CFM-56 engine might be an alternative.

Fokker's most promising military programme—the assembly of the F-16 fighter—is going according to plan. The first aircraft for the Royal Dutch Air Force will be handed over June 6. Fokker is due to deliver a total of 102 F-16s to the Dutch Air Force and other 72 to Norway. It is also making 6 centre fuselages as well as wing doors and wing moving parts for other NATO air forces.

Upward

Fokker expects to report small profit for 1978 after making a record loss the year before. It faces three or four difficult years but expects an upward trend of profits to continue. Turnover should double over the same period. Apart from the need for staff it also faces shortages of skill staff—despite the high level unemployment in Holland. Skilled workers, when they can be found, are often unwilling to move. It is also dissatisfied with the levels of skills shown by school-leavers and says it has to train them up to its standards.

With commercial prospects brightening, Fokker is now patient to end its merger with the German VFW concern. It faces a demand for several hundred million guilders to pension from the West German Government. A lead German banker has been appointed to mediate. But Fokker is not hopeful that this deal with its past will be easily and swiftly broken.

Charles Batchelor, Amsterdam Correspondent

ITALY

Happy American link

AEROSPACE IS turning into one of the success stories of Italian industry, and a welcome show-piece for the country's much criticised public sector, which controls several of the main manufacturers. In statistical terms alone turnover rose 7.3 per cent at constant prices to L200bn (\$1,06bn) last year, while exports rose 15 per cent to L430bn.

Substantial difficulties of course exist. The financial state of much of the industry exhibits that familiar weakness of other major sectors, high indebtedness and often an inadequate capital base. Aerospace has long suffered from the weakness of the domestic market, and until recently an excessive dependence on the military sector.

In both absolute and proportional terms defence spending in Italy is lower than in comparable Western European countries. The Institute for Strategic Studies estimated it at \$4.4bn, or just 2.6 per cent of Gross National Product in 1977. At the same time the chronic tardiness of payment by the Air Force has added to the financial difficulties of the various contractors. Aeritalia for example, the most important concern created from the merger of Fiat's non-engine division and the aerospace interests of the IRI/Finmeccanica State holding group, recently blamed its 1978 loss of Lire 17bn (\$20m) in large part on the Lire 50bn still owing from the Defence Ministry on completed contracts. In addition the company still has not received a promised Lire 100bn of aid from the Government to help it with its work on Boeing's new 767 medium range passenger aircraft, forcing it to find the funds elsewhere but only at the cost of a further rise in its indebtedness.

Buoyancy

Under the programme Aeritalia will be responsible for most of the moving parts of the 767's wings and much of the nose cone to set alongside the work it will continue to do on the DC-9, and DC-10 aircraft of McDonnell Douglas. The buoyancy of the company's position is such that only muted complaints were heard when Aeritalia the State airline earlier this year confirmed its plans to add eight European Airbus competitors to the 767—to its fleet, with options for a further three, as part of its substantial current expansion programme.

However, if the Boeing deal has been the most spectacular development for the industry in the last 12 months, the military side as well has seen considerable activity, and contributed to the 6.5 per cent increase in Italy's aerospace workforce last year to around 35,000 men, a respectable proportion of whom are employed in the depressed south.

For Aeritalia, indeed, the military side remained the mainstay last year, including its 12 per cent stake in the Anglo-German-Italian Tornado Multi Role Combat Aircraft project, of whose total 809 order 100 will go to the Italian Air Force, directly assembled by the company. The other lynch pin of its military work is the G-222 military transport which is proving a distinct, indeed controversial, export success. A projected \$400m order for

20 of the aircraft to Libya was held up by a veto from the U.S.—ostensibly on security grounds since it was fitted with General Electric T-64 engines. But many Italian industry officials suspect that ordinary commercial considerations had as much to do with the obstruction of a sale of an aircraft which competes with Lockheed's own Hercules C-130 military transport.

It is now on the cards that this embargo will be circumvented by fitting the G-222 with Rolls-Royce engines. In the meantime three have been sold to Argentina and one to Dubai, while Aeritalia salesmen are optimistic of penetrating other significant foreign markets. In the longer term Aeritalia will be in large part responsible for the replacement of the ageing Fiat G-91 with a new short and medium-range fighter now designated as the AMX. General endorsement for the aircraft, of which the Italian Air Force may require between 150 and 200, has been given by service chiefs and it now seems probable that the long-stalled project will go ahead.

There has been much talk of international collaboration on the AMX, possibly involving Sweden on the airframe, and Rolls-Royce, via its proven Spool engine, on the powerplant side. However, according to Signor Fausto Cereti, Aeritalia's managing director, the odds are that the aircraft will be an all-Italian affair, powered by an engine developed jointly by the relevant divisions of Fiat and Alfa Romeo, a subsidiary of Finmeccanica/IRI.

Aeritalia's airframe partner will be the country's largest privately owned aerospace concern, Aermecc, a good illustration of the dynamic medium-sized enterprise in which Italy specialises. Of its L 60bn (\$71m) sales in 1978, four-fifths went for export, largely a reflection of the success enjoyed by its MB-326 fighter-trainer, of which over 300 have been sold. Macchi has now begun production of the scheduled replacement of the MB-326, the MB-338, of which 100 have already been ordered by the Air Force, and whose prospects, if price is anything to go by, must be counted bright. In a recent interview Signor Fabrizio Foresio, managing director, and

member of the family which controls the company, claimed that the MB-338, powered by a Piaggio motor, cost around L1.5bn apiece, half the price of its direct French competitor produced by the Dassault group and a third that of its British rival manufactured by Hawt Siddeley.

The other focal point of the public sector's involvement in aerospace is the Agusta group, now 51 per cent controlled by the State conglomerate IRI and specialised above all in helicopter field. Agusta is a group which boasts sales over L310bn (\$364m) against under L64bn five years ago, a which employs 9,100 workers. Exports now account for 80 per cent of its revenues, and rarely indeed for the State's tax—it is profitable, to the tune of L5bn in 1978.

Promoting

Agusta is particularly proud of its record in promoting jobs. For example a new plant employing 1,000 went on stream at Brindisi in 1978. For the future prospects are bright: orders hand exceed L1,000bn, and by 1985 a predicted annual growth of 15 per cent of the world helicopter market, at this year are forecast at over L420bn.

It is against this encouraging background, scarcely thinkable a decade or so ago, that the Government must tackle the difficulties of Italy's aerospace sector. The first place to ensure adequate financial support along the lines extended by the much larger aerospace industries of nations like Britain or France, and in the second place to establish a more efficient organisation upon a sector which by international standards is highly fragmented. The signs are, though, that once the present period of protracted political uncertainty is over the authorities will turn their attention to the industry. Not least of the arguments pressing them in that direction is that the sector is exactly the sort of high technology area in which a nation like Italy must logically concentrate for the future.

Rupert Cornwell

FASTER, FURTHER, HIGHER, SAFER.



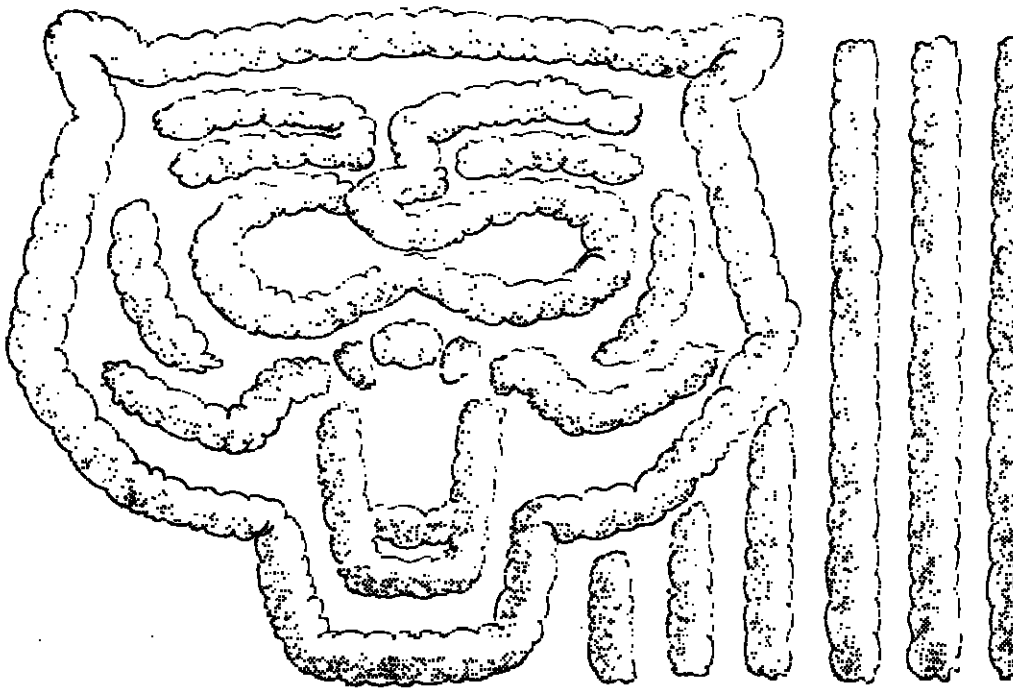
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An impressive list that justifies the claim that Fothergill & Harvey is a name that's written in the sky.



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السوق المالية

AEROSPACE XV

SWEDEN

Go-it-alone policy abandoned

After wrangling for three years over defence spending and future requirements of the Swedish Air Force the Riksdag (parliament) last month finally went out: Saab-Scania's light aircraft project. Without a contract industry spokesmen had constantly reiterated Sweden's capacity to design and build its own military aircraft would be lost.

The Riksdag decision was not a-cut and left some ends tied. Questions about how the Air Force are to be met in the future and the role to be played by the Swedish companies remain unanswered. Saab-Bofors have been given no compensation through a contract to develop an anti-ship missile for the Navy and Air Force.

It will soon have to decide whether or not to go ahead with its own small feeder aircraft project. This, it is calculated, will involve an investment of at least SKr 500m (\$115m).

Known as the "transporter" this aircraft has grown in concept over the last two years from the original idea of a rugged "flying truck" capable of carrying freight or 20 passengers between landing strips in developing countries.

Finance on a grand scale

The AN estimated \$40bn likely to be spent by the world's major airlines over the next few years on the purchase of new jet airliners of all kinds quite apart from the substantial sums that will also be committed on smaller types such as "commuter" lines, feeder aircraft and executive jets. It is clear that the airline industry's hands on the world's capital markets will be massive.

Such that delivery dates are already lengthening into the 1980s, and it is possible for would-be purchasers to pay deposits to secure positions on the production lines which can be sold at a profit before the aircraft is completed and delivered, in the event of the original buyer, either changing his mind or not being able to complete the deal for any reason.

1979 an even bigger year for jet-buying than 1978, when over 700 new jets were firmly committed for delivery in the early 1980s.

For example, a statement recently by the Ex-Im Bank chairman, Mr. John L. Moore, indicated that it would spend at least \$4.5bn over the next two financial years to support foreign purchases of U.S.-built commercial aircraft and engines, accounting for about half of its resources for the period.

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M.D.



*One day we will rip away the "blinding barriers of darkness."*

"Night Flight" by Antoine de Saint Exupéry, 1932



"They flew in submission to those elemental divinities—day, night, mountain, sea and storm."

They were the men who pioneered night flying in the 1920s, and upon whom Saint Exupéry based his heroic and tragic character, Fabien.

Fabien fought for his life in a flying machine with little more than an engine and a radio.

Had he been given the "vision" Singer gives pilots today, the story of "Night Flight" might have taken a different turn.

For the "vision" Singer provides is an inertial navigation system that lets a pilot know where he is at all times... in the calm, in the

storm, day and night. No matter where and how he turns. Because it gathers all its information internally, rather than on radio waves or external reference points.

In fact, this system can be seen in the new F-16 at the Paris Air Show. The pilots will train in simulators designed by our Link Division, which celebrates its 50th anniversary this year.

As one watches the F-16 take off and climb vertically 30,000 feet before reaching the end of the runway, think of Fabien.

Certainly that thrust, guided by the Singer system, could have delivered him from

the cyclone he faced that terrible dark night.

Although the risks are steadily decreasing, very few endeavors still hold out the spirit and sense of adventure of flying.

For this reason, Singer has produced a 30-minute film version of "Night Flight" starring Trevor Howard, Bo Svenson and Céline Lomez. It has been highly acclaimed in Europe and the U.S. And we think you and your family will enjoy reliving the night Fabien set out from Patagonia to Buenos Aires with the night mail. It is a tribute to the ability of man to rise to enormous heights in the call of duty.

**SINGER**

During the Paris Air Show at Le Bourget, you can see "Night Flight" in the Air Museum

Jeff H. H. H.



# A close look at the DC-10 story

BY MICHAEL DONNE, Aerospace Correspondent

The search for the cause of the crash of an American Airlines DC-10 at Chicago, killing 273, now appears to be moving into other areas, as more of the world's fleet of 274 McDonnell Douglas DC-10 tri-jet airliners complete their engine-mounting inspection and are cleared back into passenger service.

Much of the aircraft was destroyed in the accident, but enough parts were recovered, including the flight-data recorder and the crew cockpit voice recorder, to enable the scientists and technicians of the U.S. Federal Aviation Administration, the National Transportation Safety Board, and of McDonnell Douglas and General Electric, the airframe and engine makers, to piece together during the coming months precisely what caused the crash soon after take-off.

The initial decision by the FAA to ground all the 139 DC-10s in the U.S. fleet—which was automatically complied with by all other DC-10 operators outside the U.S.—was the immediate reaction of any competent airworthiness authority, given reasonable grounds for suspicion of possible causes of the accident in this case it was the broken bolt from the pylon-wing attachment mounting found on the runway close to the take-off point of the DC-10.

## The pylon

When the inspection of such bolts on all DC-10s began to show further signs of faults or damage in other parts of the engine-nylon-wing mounting assembly, the justification for the FAA's original ruling became apparent. It also justified the authority's second order, requiring further grounding and inspection not just of the pylon-

wing attachment itself, but of the whole structure securing the engine to the wing.

In the DC-10, the engine is attached to the wing by means of a pylon, through which all the fuel and electrical systems run. This pylon is attached to the wing by various yokes, including what is called a "thrust link"—a small metal spar attached to the engine and the wing and at the other to the pylon. In this spar there are two "bushes," or cylinders of metal, which are in effect vibratory thrust-absorbers and which are in turn fastened to the spar by bolts, one for each bush.

It was one of these bolts that was found broken on the runway close to the take-off point of the ill-fated DC-10. This bolt is not a load-bearer. If it came loose, it would not in itself cause the engine to fall off, but over a period of time would probably result in excessive vibration from the engine through to the wing structure.

In addition, in the entire engine-nylon-wing mounting assembly, there are some 20 small fasteners attached to secondary structures, but again not in themselves load-bearing. In the checks conducted so far on the world fleet of DC-10s, some broken and loose bolts have been found, together with some damaged fasteners. In all, such checks, according to reports from the U.S., appear to have been found in some 15 to 30 DC-10s in the U.S. fleet, but in only two aircraft elsewhere. In the rest of the aircraft checked (well over 200 by late yesterday), no faults of any kind appear to have been found, and the aircraft concerned have been returned to service.

As the checks have progressed, the officials of the FAA have been revising their first suspicions as to the cause of the Chicago accident. Originally, they undoubtedly thought that

the broken bolt found on the runway might have been the cause, which was why they ordered checks on all bolts. But as those inspections turned up other faults (with fasteners, and in some cases also corrosion in the engine-nylon-wing mountings) the FAA decided to order the second mandatory inspection. At the same time, however, as it became clear that the broken bolt was unlikely, by itself, to have caused the engine to fall off the wing, the new theory was that it was actually sheared off by the engine itself coming off. This

**NUMBER OF FATAL ACCIDENTS PER 100,000 FLYING HOURS (1968-1977)**

Lockheed L-188 Electra: 0.58
Convair 580, 600 and 440: 0.25
Convair 440: 0.15
Lockheed L-1011: 0.12
Boeing 707: 0.11
Douglas DC-9: 0.11
Boeing 747: 0.08
Douglas DC-8: 0.07
McDonnell Douglas DC-10: 0.04
Boeing 727: 0.05
Boeing 737: 0.04

Source: U.S. National Transportation Safety Board

is why emphasis shifted to inspection of the entire engine-nylon-wing mounting structure. The purpose was to determine whether there was any metal fatigue or other problem in that installation which might have caused the accident and might be a continuing safety hazard to all other DC-10s flying. As more and more DC-10s are cleared for passenger service, even this theory has to be regarded with caution.

Another factor tending to support the belief that the accident may have had other causes is the sequence of events leading up to it. For example, the con-

troller in the tower at Chicago is reported to have seen fuel being vented from the port engine of the DC-10 before take-off, causing him to ask the pilot "do you want to come back?" and getting no reply, presumably because the crew were too busy with an emergency. Clearly, an experienced controller who had seen many DC-10 take-offs, saw something sufficiently untoward to make him ask that question.

Only seconds later came the much-reported "drama" from the cockpit, followed by the engine coming off, and the crash. To have one engine fall off at full take-off thrust at such a low altitude is regarded by pilots as virtually uncorrectable. To lose power at take-off in one engine is one thing; to have the engine actually detach itself from the wing is another.

If that sequence of events, as reported at the time, subsequently proved to have been correct—something which only the technicians investigating the crash can ascertain—it would seem to imply that something other than faulty bolts or fasteners was seriously wrong with the aircraft's port engine from the moment it began its take-off run. It is this which the detailed technical investigation must establish. Doing so may take many months of painstaking research, subjecting every part of the aircraft to physical examination while also studying the airline's own detailed maintenance records, and the operational history of the specific aircraft involved.

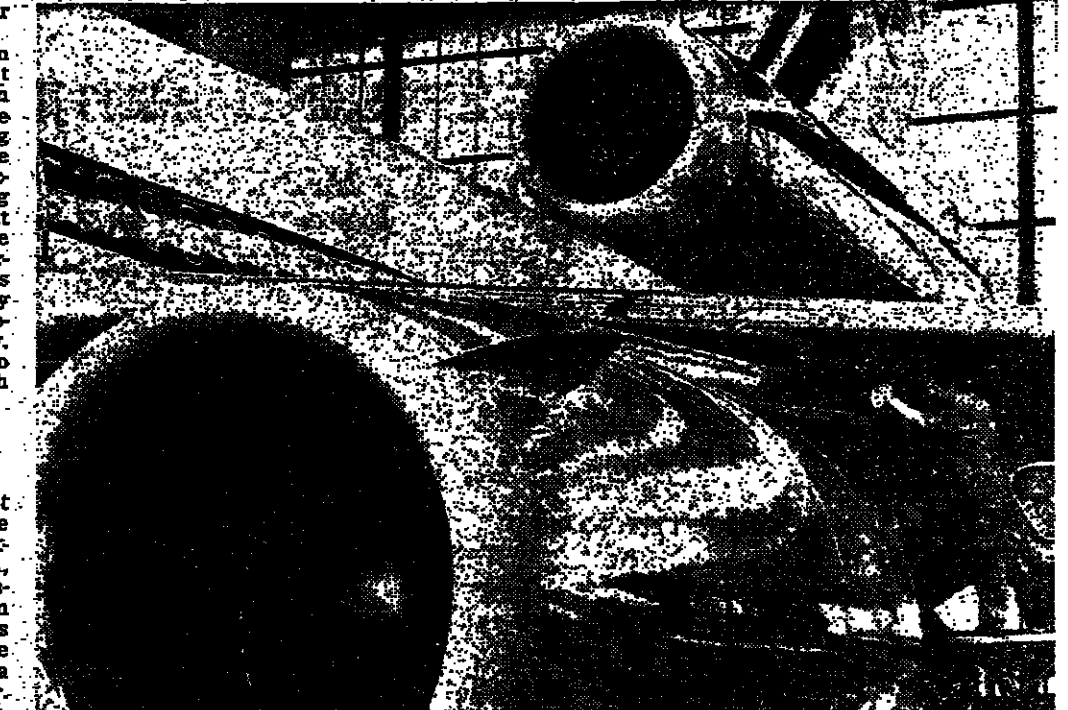
This investigation, of the kind conducted by every country's airworthiness organisation in the event of a major accident, is not necessarily intended to apportion blame—although that is something the legal experts will be particularly concerned with, for it could have a profound impact upon subsequent

insurance claims and other litigation. Primarily, the investigation must determine whether or not there is any intrinsic design fault or other weakness in the aircraft concerned, requiring more fundamental corrective techniques than visual inspections of engine-nylon-wing mounting structures. Until that investigation is completed, the best that any airline, or airworthiness authority, can do is to take such precautionary action as seems appropriate, regardless of the bad publicity, the confusion, and the delays to airline schedules that such action causes.

## Concern

In the UK late last week, it was felt that despite some of the statements reportedly emanating from officials of the FAA, concerning "grave and potentially dangerous deficiencies" in the DC-10, insufficient was known about the cause of the crash for anyone to take a specific stand on the matter. But, the results of the inspections conducted so far must give rise to some concern.

It seems fair, since damaged bolts and fasteners have been coming to light as a result of the checks over the past week, to question whether airline maintenance techniques in some places have been as meticulous as they ought to have been. So far as the DC-10 is concerned, the bolts and fasteners so widely publicised this past week are generally inspected every 4,800 flying hours, or every nine to 12 months, depending upon how much the individual aircraft is used. DC-10s will now be inspected every 100 flying hours or 10 days, whichever is sooner, until the accident investigation clarifies matters. Overhaul intervals vary



A Lufthansa DC-10's engine mounting is extensively checked.

widely between different aircraft and different parts of those aircraft, and while specific "time-between-overhauls" are laid down by manufacturers and approved by airworthiness bodies, it is impossible for them to monitor every airline's checks on every aircraft throughout the world all the time. Much has to be left to the good sense and safety-consciousness of the individual airline. In this context, it is also fair to point out that while some members of the FAA itself this past week have been critical of the DC-10, it was that body which went over the DC-10 in the first place several years ago with a fine toothcomb. It then granted the original full

Certificate of Airworthiness, clearing the aircraft for passenger service. In this context, it is also worth pointing out that despite two terrible crashes—that of a Turkish Airlines DC-10 near Paris some time ago, and that recently at Chicago—the U.S. National Transportation Safety Board's own figures show the DC-10's safety record hitherto to be better than that of many other U.S.-built airliners, as the accompanying table shows. It is based upon a number of accidents involving fatalities per 100,000 flying hours, over the period from 1968 to 1977, and which, before the Chicago crash, put the DC-10 in ninth place

in the "safety league table." The list must be treated with some caution, for some of the aircraft involved by far more than others—the short-haul jets such as Boeing 727s and 737s fly more sectors than, say, the medium-to-long haul TriStar, 747 or DC-10. As a result, it would be wrong to pass judgment on one aircraft's safety record over another's. But if the table shows anything at all, it is that despite major accidents, such as that at Chicago, the overall safety record of the world's scheduled airlines and major aircraft types is not as bad as some of the reports over the past week would appear to indicate.

## Letters to the Editor

### Index-linked pensions

From the Secretary General, Civil Service National Whitley Council, Staff Side

Sir,—Mr. Pilch (May 17) made what may seem to be a reasonable attempt to answer some of the criticisms levelled at public service pensions. Perhaps that was to be expected from the chairman of an organisation, the National Association of Pension Funds, which claims to represent the interests of both pension providers and pensioners.

He is quite right in saying that no reasonable person would want to deprive policemen, nurses, firemen, the armed forces and the other public services covered by the Pensions Increase Act 1971 of the benefit of the Act. What is the benefit of the Act? We hear a lot about index-linking, inflation-proofing, post-award dynamism and escalation of pensions. What these terms hide rather than reveal is the real purpose of the Act which is quite simply, and quite reasonably, surely, to maintain the purchasing power of pensions in payment—not to increase their value, not to increase the standards of living of pensioners, but simply to maintain the value of the pension at the time it was awarded, and to avoid pensioners slowly falling into hardship by the ravages of inflation.

This is a requirement which is so clearly essential to the wellbeing of pensioners that it is one of the main features enshrined in the new state pension scheme, a scheme which over the next 19 years will become the main source, either directly or indirectly through guaranteed minimum pensions, of inflation proofed pensions for the vast majority of pensioners in this country.

No reasonable person can quarrel with the notion that it is right to aim as a minimum to maintain the purchasing power of pensions, and yet Mr. Pilch suggests that the public service arrangements should be changed in a way which could have this effect, if the Parliamentary approval he suggests should be necessary on occasions, was not forthcoming. The system Mr. Pilch suggests is not really so very different from that which obtained from the passing of the 1971 Act. Before 1971, a special Act of Parliament was needed each time to increase public service pensions, a system which Mr. Kenneth Baker MP, in introducing the 1971 Act, said required pensioners to come "cap in hand" to Parliament each time for an increase. A humiliation to the pensioners which he said the Act was designed to end, as well as serving as an example to all occupational schemes of the kinds of standards they should provide.

But in any case how would this change help those in occupational pensions schemes which are inadequate to the task of providing a reasonable and sure level of income in retirement? If the Government, which has acted so generously on police pay, was to take away from policemen their index-linked pensions how would that help those pensioners who rely on insurance companies to provide their occupational pensions; companies, which have flatly refused to consider funding for inflation?

### Special salary increases

From Mr. A. Fishman, Civil Service National Whitley Council, 19 Rochester Row, SW1

Sir,—Mr. Pasfield (May 31) suggests that index-linked pensions should be made available to all employees, not just those in the civil service. I would recommend an alternative which would be consistent with Mr. Pasfield's theme but which would avoid further aggravating the gulf between different sections of society. My alternative is to abandon index-linked pensions for the civil service in return for which a special salary increase which is awarded equal to the Government Actuary's figure for the proportion of salary index-linked benefits represents. I would add an extra 1 per cent to this figure for good measure. The beauty of this method is that those not participating in index-linked benefits would regard this approach as a bargain as would those who are enjoying such benefits and who have in the past strenuously defended the Government Actuary's calculations. This measure would also be anti-inflationary and result in a snowball effect in a direction opposite to current trends. A. S. Fishman, Amberley Lodge, 13, Beekwood Avenue, Finchley, N3.

### An impossible task

From Mr. T. Laybourn

Sir,—When it was announced that the Government Actuary had suggested that the value of civil servants pensions being index-linked was, in his opinion, worth 2.6 per cent of their salaries, my first reaction was to immediately write a strong letter of protest that the figure, which I regarded as much too low, should have been arrived at by one man — aided no doubt by many of his colleagues but all of whom are civil servants. On second thoughts I decided to wait a while and see the reaction of others whose views you would no doubt be publishing. These have appeared and I

### Works of art and tax

From Mr. D. Mahon

Sir,—Mr. Hugh Leggett (May 31) is entirely correct in implying that the surrender of works of art and cultural property "in satisfaction of tax" is in essence no more than a decision in exceptional circumstances by the state to protect our common heritage by accepting payment in kind instead of cash. Moreover, the principle that the state, in order to further such protection, may refrain from raising all the revenue in cash to which it would in ordinary circumstances be entitled has long been established by an administrative provision that sales of works of art to public museums carry certain reductions in tax liabilities. The short-sighted and badly thought-out policy of the late Government for the repeal of the provisions for surrender in lieu would have had the effect of neatly getting Treasury pseudo-theologians out of a situation in which they had to sustain the convoluted and implausible contention that "in lieu" acceptances, though not formally and in law purchases from tax debtors, should nevertheless be deemed to be such for accounting purposes—with the consequence that acceptances become involved in expenditure priorities. There are widespread hopes that the Minister for the Arts (to whose constructive attitude on the subject Mr. Leggett refers) will be successful in securing the definitive abandonment of an egregious action which is capable of causing untold damage to the future prospects for our cultural inheritance. Denis Mahon, 33, Cadogan Square, SW1.

### VAT returns in a rush

From Mr. S. Blanche

Sir,—The VAT computer is now back in action and return forms for the tax period 72 ended March 31 will be sent to traders as soon as possible. These returns were due by April 30 so the date is being extended to June 11. It is quite appalling to those of us having to deal with these returns, that we are now faced with colossal work pressure due to the strike action by civil servants working within a protected cloak of unsackability and inflation proof pensions. It is a scandal that the authorities concerned should be allowed by Parliament to act in such a cavalier manner. I trust that the new political flavour of the Government will put a stop to this nonsense in future. S. Blanche, Blanche and Co. Thames House, Wellington Street, Woolwich, SE18.

### U.K. Post Office Engineering Union conference, Winter Gardens, Blackpool (until June 8).

Bakers Union conference, Margate (until June 8).

Lecturers' pay talks resume. Liberal Party and Labour Party statements on European Parliamentary elections — Mr. James Callaghan, Labour Party chairman, speaks at rally, Islington Town Hall.

Stock Exchange turnover figures released.

Lord Armstrong, Midland Bank chairman, gives Institute of Directors lecture on a more logical way of presenting the nation's budget.

## Today's Events

Overseas: Third day of Pope John Paul II's visit to Poland (until June 9).

Italy: general election — second day.

Canada's minority Government takes office.

King Juan Carlos and Queen Sophia of Spain on official three-day visit to Morocco at invitation of King Hassan.

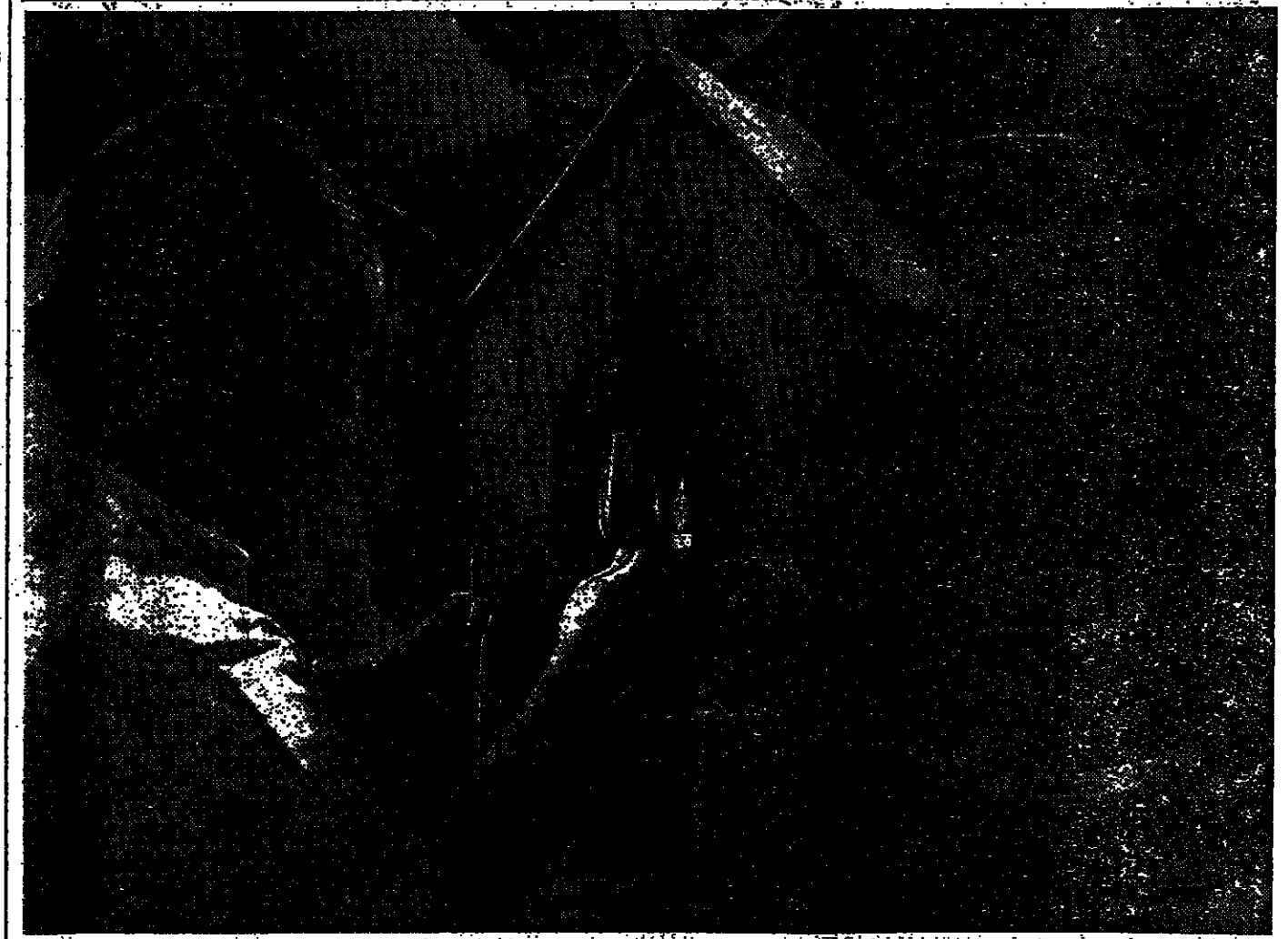
Non-aligned movements executive meeting in Colombo to discuss Pakistan's application for

membership (until June 9).

OFFICIAL STATISTICS Treasury publishes U.K. official reserves for May. Department of Industry publishes investment intentions of the manufacturing, distributive and service industries (1979 and 1980). Bank of England releases capital issues and redemptions (during the month of May).

COMPANY RESULTS Final dividends: Pritchard Services Group, Soanama Group, Interim dividends: Albert Fisher Group, Martin The Newsagent.

COMPANY MEETINGS See Financial Diary on page 17.



## The Chapel

### Where a classic sherry comes to light.

Why one sherry develops a different character from another is a subject as shrouded in mystery today as it has ever been. We know how it happens. Certain of the young wines develop a yeast on the surface — called flor — while others don't. This is what differentiates the finos and amontillados from the olorosos. Even the inexperienced eye can appreciate this. But it takes the eye of a true master-craftsman to tell which of the young wines will develop the subtlety and delicacy of a classic fino and which will mature with the extra nuttiness of a classic amontillado. With the aid of the pure, flickering light from a candle, this fine distinction is made. As it has been for generations to select the classic finos and amontillados to come. The classic fino is very pale in colour and very dry to taste with a subtly delicate bouquet. Luncheon Dry is just such a fino. Serve it chilled to appreciate fully its true character. The classic amontillado is allowed to mature for longer in the cask, taking on a richer colour and a subtle nutty flavour. Such is the character of Club Amontillado.

Luncheon Dry & Club Amontillado. Two classic styles of sherry from Harveys of Bristol.

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Mr. Christopher Glynn, Chief Commodity Analyst, Precious Metals, Consolidated Gold Fields Ltd.

Mr. R. Schriber, First Vice President and Head of Precious Metals, Credit Suisse

Mr. Philip Taylor, Mining Investment Analyst, Rowe & Pitman

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# 'Green Petrol'—a possible palliative for the oil crisis

BY DAVID FISHLOCK, SCIENCE EDITOR

A NEW energy term—"gasohol"—has begun to appear in newspaper headlines. This is an American word meaning a mixture of gasoline (petrol) and pure alcohol, suitable for fueling a motor car. Gasohol received a surge of publicity when it went on sale recently in New York.

However, the idea of blending alcohol with petrol as a transport fuel is not so new. Many in Britain will still remember Cleveland Discol, a gasohol advertised by Cleveland Oil in the 1950s, made with alcohol it bought from Distillers. Racing car drivers were enthusiastic customers. In its day Distillers had made alcohol for industry both by distilling surplus whisky in times of recession, and by fermenting molasses. Since the late 1960s, however, when it sold its chemical interests to British Petroleum, it has restricted its interest strictly to drinkable products.

## Potable brands

Alcohol—also known as ethyl alcohol or ethanol—is made in two basic ways: by fermentation in the case of all credible forms of potable alcohol, or by chemical reaction from a feedstock derived from oil. The newly discovered interest in adding alcohol to petrol to ease oil supplies is confined to the fermented forms of alcohol which make no demands upon oil.

Several nations are showing great interest in making power alcohol from crops in the time-honoured way used for potable brands. Almost any crop except wood can be used. But national reasons for building a "green petrol" industry can be surprisingly different from country to country.

The most highly publicised of the nations which have ventured into "green petrol" is Brazil, which has a dauntingly high balance of payments deficit arising from the rapid rise in OPEC oil prices. The Brazilian Government has therefore made it a tenet of its energy policy to run cars on a 20 per cent alcohol blend with petrol. Last year it claimed that 15 per cent of its cars were already running on gasohol. Currently production of "green petrol" is running at about 1m tonnes a year and the Government's target is 3m tonnes a year by 1982.

The initial source of Brazil's alcohol is molasses, a brown, syrupy by-product of the production of sugar, traditionally

used to make rum with the heavy aromas. Well-established practice has been hastily adapted to meet the Government's demands. But even from Brazil's vast sugar-cane industry there is nothing like enough of the molasses by-product to meet the Government's target for gasohol.

Now they are beginning to look at cane juice, the sugar solution squeezed from sugarcane in processing. A Brazilian spirit called pinga, distilled in pot stills, has long been made in this way. The latest move is arousing much interest among sugar refining manufacturers who are offering to build packaged distilleries designed to pump cane juice—14 per cent sugar solution—directly into fermenters and thence to the distillation columns.

Thailand sees "green petrol" from a significantly different viewpoint. It has a Minister for Industry who is keen to control the effects on his economy of annual variations in harvests. If Thailand's surplus crops could be channelled into a single product such as power alcohol it would take a lot of the uncertainty out of an agricultural economy, and the Government would have a powerful economic regulator. The minister is therefore inviting bids for the supply of turnkey distilleries of the kind being tendered for cane juice in Brazil, but readily adaptable to whichever of its main crops—sugarcane, molasses, rice, cassava and maize—may happen to be in surplus.

Sudan affords yet another rationale for setting up a power alcohol industry. It is building a vast sugarcane industry in a particularly fertile triangle between the White and the Blue Niles. The Kenana sugar project is scheduled to start operating at the end of this year. But deep in East Africa, nearly a thousand miles by rail from a seaport, the molasses by-product is an embarrassment. It may even have to be dumped in the desert—unless it can be fermented to make power alcohol.

In each of these cases the economics of making green petrol will be finely balanced. Brazil, for example, used to export more than 500,000 tonnes of molasses a year. Its disappearance into Brazilian distilleries has caused the world price of molasses to rise to a level where it may become tempting to start exporting again.

The U.S. is already wrestling with the economics of gasohol. More than 500 petrol stations—mainly in the cornbelt of the Midwest—are already in the gasohol business, selling a blend containing 10 per cent alcohol. Optimists at the U.S. Department of Energy estimate that national gasohol consumption could reach 75m-100m gallons this year. Others believe this to be a ludicrously high figure, considering that only two distilleries at present are supplying the market. One big source of the alcohol is maize grown for animal feedstuffs—that is, mainly for its protein content. The starchy component, incidental to this product, is being fermented to make green petrol at a distillery in Illinois.

Technologically, power alcohol affords some exciting new possibilities for the chemical processing industries. Distillation itself is one of the oldest methods of alchemy for separating liquids with different boiling points. Potable alcohol—of which Scotland alone distills about 148m gallons a year in about 148m stills—is obtained by distilling liquors produced by fermenting the appropriate crop in batches.

When sugarcane juice is fermented in batches, as is done today, the yield of alcohol is about 7 or 8 per cent by volume. Potable spirits will vary quite widely around a mean value of about 40 per cent. But alcohol suitable for blending with petrol must be anhydrous—free from water—and therefore requires a three-stage distillation, with the final one yielding virtually 100 per cent pure ethyl alcohol.

## Continuous

According to Tate and Lyle, if cane juice could be fermented continuously instead of in batches, there could be significant gains in the productivity of the process, and a large reduction in size of the distillery. At its research centre near Reading the company has been operating continuous fermentation on pilot-plant scale for the last few weeks. With alcohol concentration set at about 12 per cent, the process is promising a productivity 2.5 times as high as batch operation, and a fermentation plant only about one-tenth the size.

Tate and Lyle, as the world's biggest refiner of sugarcane, has an obvious interest in pursuing new outlets, not least since the profitability of sugar

refining itself is low. But sugarcane is one of the most efficient ways of converting and storing solar energy to be found in nature, and much better than anything the physicists have managed to make. It is already established as a 100m tonne-a-year crop, with the potential for considerable expansion in those areas—such as Sudan or the Amazon Basin—with abundant sunshine and water.

Sugarcane has another important advantage, in that the bagasse—the fibrous by-product remaining once the cane juice has been squeezed out—is a valuable fuel, in spite of 50 per cent moisture. It is already used to fuel many sugarcane factories. A tonne of bagasse is equivalent to 1 barrel of oil.

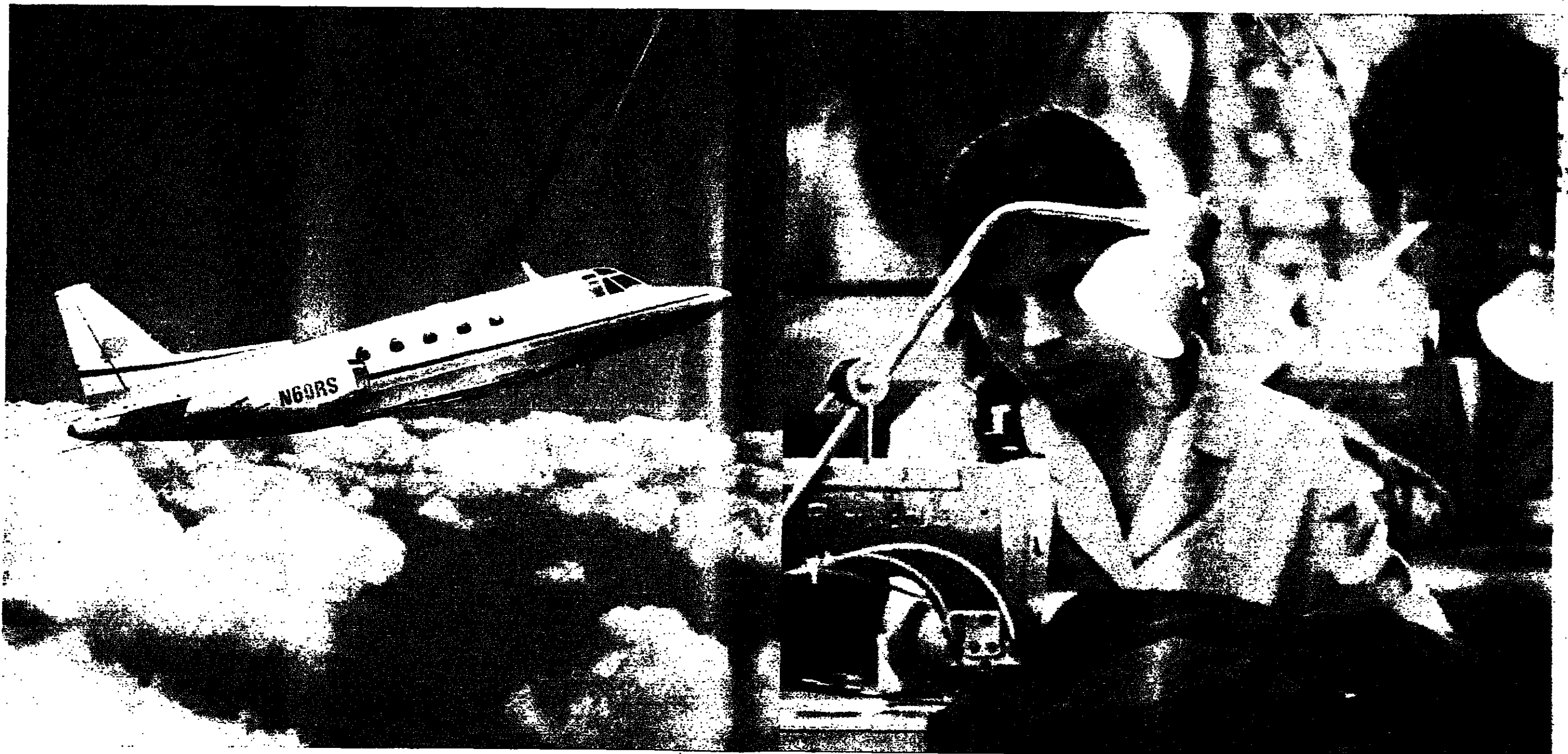
## No market

Other crops may afford much greater advantage in a specific situation. Cassava (a root otherwise known as tapioca or manioc) is as efficient a solar converter as sugarcane and a staple foodstuff throughout the tropics. But there is no international market in cassava at present to match that of sugarcane, and no combustible residue to provide fuel for distillation.

In Britain, the Department of Energy has been studying the possibilities for "energy cropping" for two or three years. But there is no international market in cassava at present to match that of sugarcane, and no combustible residue to provide fuel for distillation.

Selling advanced technology overseas to enable other countries to exploit energy crops appears to make much more sense for Britain. At Bromley in Kent, Tate and Lyle Engineering has built up in the 1970s a substantial new business for the group in marketing group processing technology worldwide. Dr. Michael Bennett, deputy managing director, sees autonomous distilleries in the form of turnkey projects at around £9m, a time as a major new market just beginning to open in such countries as Brazil, Thailand, Sudan and the U.S. The business is beginning to move so fast, he says confidently, "we'll have a plant commissioned somewhere in the world this year."

This article appeared in an early edition of last Tuesday's Financial Times.



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UK COMPANY NEWS

# Sears begins well and expansion plans continue

The current year has started satisfactorily for Sears Holdings despite the bad weather and the economic conditions which affected some of its activities in the early months, Mr. Leonard Sainer, the chairman, says in his annual statement.

Sears, the footwear, stores, jewellery, property and engineering group which owns Selfridges and bookmakers William Hill, is dependent to a large extent on consumer spending particularly in the second half-year.

But Mr. Sainer tells shareholders he is confident that with his wide spread of activities it is in an advantageous position to obtain an above average share of the consumer market.

With the group's financial resources and strong property base providing a secure background from which to trade and expand the directors continue to seek further acquisitions in Europe and the U.S. to improve on results now flowing from its businesses overseas.

In the year to January 31, 1979, turnover, excluding VAT, exceeded £1bn for the first time, Mr. Sainer notes. Pre-tax profit rose from £65.51m to a record £81.06m.

Two main factors contributed to the increased trading profit of £56.8m in footwear retailing and manufacturing, Mr. Sainer says. There was a noticeable change in clothing fashions which stimu-

lated the buying of a wider range of footwear as well as a swing towards better quality, mainly leather, footwear.

However the industry is currently facing an acute world shortage of leather creating an unprecedented increase in prices which may well result in a wider use of synthetics in the future.

The year was again marked by heavy investment in modernisation and general improvement of branches and this programme continues both in the U.K. and in the Netherlands. The voluntary undertaking given, along with most other footwear retailers, to restrict margins for 1978 and 1979 to those of 1977 has had the effect of making Sears invest more and work harder to achieve its results.

In common with other London West End stores and hotels, Selfridges had a quieter year with fewer foreign tourists enabling the directors to restore the balance by increasing attention to the home trade. The programme of building and modernisation is now largely complete. The refurbishing of Lewis's stores has also continued enabling it to hold its place in the extremely competitive market.

For Miss Selfridges trade was disappointing and with the young fashion trade becoming more competitive much effort has been put into ensuring that the 52 Miss Selfridges outlets remain a

leading young fashion group.

Results of the jewellery retailing interests — including Garrard and Mappin and Webb — were satisfactory.

In engineering, the year was a further period of expensive reorganisation which should put this division in good stead for the future and for improving its profitability, Mr. Sainer adds.

The improvement of facilities at many depots should enhance the motor vehicle division's position in the trade, while in licensed betting offices, efforts are continuing to provide improved services including the restructuring, expansion and modernisation of many of the older betting shops.

In an improved home UK housing market, 846 units were sold against 714 the previous year and present indications on the property development and investment side show a continued high level of interest by purchasers.

The group's U.S. subsidiary, Sears Industry Inc. achieved a trading profit of £1.8m compared with a previous loss of £1.2m.

Total source of funds in the year rose from £109.24m to £133.75m and application from £68.91m to £108.41m with the increase in working capital dropping from £40.43m to £25.34m.

# Better year for Tootal

THE PROSPECTS for Tootal in the current year are reasonably good and the Board expects improved pre-tax profits and a reduction in financial gearing, Sir George Kenyon, the chairman, says in his annual report.

Sir George makes his comment on prospects "not because of any real hope of improved trading conditions, but because the accumulation of many small improvements added to the new acquisitions will strengthen the group as a whole."

The effects of disruptions in January will continue to be felt in the first half of this year, but the multi-fibre agreement is now beginning to assist the textile industry and there are encouraging signs of increased activity.

The group has a strong coherent base with substantial and balanced overseas operations roughly equaling UK levels of activity and earnings, the chairman says.

For the year ended January 31, 1979, pre-tax profits amounted to £21.1m against £21.7m previously, on sales of £401.38m compared with £361.2m. On a CCA basis, pre-tax profit is reduced to £10.6m after adjustments for depreciation, £9.3m cost of sales, £4.7m and gearing, £4m.

The accounts also show a £44,000 payment on termination of executive contract.

Group reserves increased by £21.3m to £79.24m and includes the surplus of £10.2m arising from the revaluation of properties, but takes into account a reduction of £0.6m in the sterling equivalent of foreign currency assets and liabilities at February 1, 1978, due to movements in exchange rates.

Expenditure on fixed assets during the year amounted to

£15.1m, of which £9.6m was in the U.K. The acquisition of Ups 'n' Downs in the U.S. increased the book value of fixed assets at January 31, 1979, by £7.4m, but the sale of Actil and Tootal Australia to Bradmill resulted in a reduction of £7.0m.

Sir George will be retiring as chairman at the end of this month, to concentrate on other activities. He will be succeeded by Mr. R. F. Audsley, the present managing director.

Meeting, Manchester, June 27 at noon.

# Turriff chief sees similar profits for current year

BOTH THE current order book and prospects in the UK at Turriff Corporation are better than they were at the same time last year, and Mr. W. G. Turriff, chairman, tells members that overall, profits for 1979 should be at least maintained.

He says there is increased activity in the oil and gas sector, a good level of construction orders, and significant projects in the refurbishing area. The group's involvement in the property development field continues satisfactorily, and the directors anticipate further growth from the plant hire interests.

"We also expect a much better return from our mechanical services division," he states.

Bad weather in the first quarter of the current year, "provided an unwelcome start," he says, and that the resultant loss of output will be difficult to recoup.

Overseas, Turriff is continuing to operate on a limited scale in the United Arab Emirates, but in the Middle East generally, Mr. Turriff says competition is both severe and unpredictable.

The directors continue to examine areas of potential business in other parts of the world, but these are unlikely to have any effect on the current year, he says, "so that overall our overseas workload will fall well short of our earlier expectations."

As reported on May 2 taxable profits for 1978 rose from £1,006m to a record £1,227m on a lower turnover of £31,967m against £33,577m. The dividend is increased by 25.5 per cent to 2,905p per share, with Treasury consent. Directors' emoluments include £29,000 retirement payments.

The bad weather disrupted and delayed progress and completion of projects in the construction division, with a consequent effect on costs. "We were thus unable to convert a substantial and sound order book into the sort

of profit which might otherwise have been expected," the chairman explains.

A lull in the oil and gas industries affected the engineering and pipelines sector. But, further progress was made during the year in mechanical services, change in the mix of business helped to improve margins also, Mr. Turriff states that, in trading terms, the overseas activities did particularly well.

but profits were adversely affected due to certain contracts being tied to the dollar, resulting in significant adverse currency movements.

Excellent results were achieved at the Abelson plant. At balance date shareholders' funds show a £1.7m increase to £5.3m. The group's liquidity position is strong and the chairman says this will enable directors to invest in ventures with good profit potential over the next few years.

# Success for S & P pensions

A successful year is reported for three of the pension investment funds managed by the Saver and Prosper Group. Total value of the Equity Pension Fund for the year to March 3, 1979, rose by £2.7m to £4.1m, with the unit price increasing by 25.9 per cent over the year.

The managers increased the content of UK equities which stood at 78.5 per cent of the value of the fund at the end of the year. U.S. shares continued to sell at historically low levels and the opportunity was taken to increase U.S. holdings from 6 per cent to 12 per cent of the fund's value. A cautious attitude

was taken over Japanese holdings and investments in that country were sold.

Further growth was reported for the Property Pension Fund over the same period with the value of the fund jumping from £1.5m to £2.6m and the unit price rising by 23.4 per cent over the year. During the year, a freehold shop property in Harrogate was added to the portfolio and contracts have been enhanced for the purchase of a freehold industrial unit in Exeter.

This completion will bring the number of holdings in the

portfolio to 13 freehold properties all let on leases with upward rent reviews at five or seven-year intervals.

The value of the Company Pension Scheme, which invests in a mix of fixed interest, equities and property through the separate funds advanced over the year from £2m to £3.6m. At the year-end, 35 per cent was held in gilts, 31 per cent in equities and 14 per cent in property. Overall liquidity was increased to 20 per cent largely due to the higher liquidity in the underlying funds.

# Bentalls starts slowly

Mr. James Spooner, chairman of Bentalls, told the annual meeting that the first few months of the current year had been somewhat disappointing.

Sales to date had risen by around 10 per cent, he said, and pointed to the frustration of shopping in Kingston at the present time.

However, with the new shopping developments anticipated, combined with the continued modernisation of the store, he believed the present trend would soon be reversed.

The Bracknell store was keeping up the excellent momentum achieved in 1978 and at the newly acquired Chatham store he was confident that the loss making trend would be reversed completely in the months leading up to Christmas and the New Year.

All in all Mr. Spooner saw no reason why the group should not have another satisfactory year.

# London & Northern first quarter progress

FIRST QUARTER figures for London and Northern Group indicate profits in excess of the same period last year, and Mr. J. H. Mackenzie, chairman, tells shareholders he is confident that further progress will be made in the current year.

He adds that the group has a satisfactory work load.

As reported on May 10 a 130 per cent increase in second half profits lifted the taxable surplus for the whole of 1978 from £6.37m to £11.77m — an 84 per cent rise — on turnover up from £163.9m to £173.8m. The dividend is stepped up from 2p to 3.35p.

Emoluments of Mr. Mackenzie rose from £28,815 to £39,851.

Considerable improved results were achieved on the construction side, both at home and overseas, the chairman states, coupled with an overall return to profitability of the group's housebuilding operation.

Profits before tax for the division nearly doubled from £3.79m to £7.48m.

The building and plant hire sector had a successful year, benefiting from increased production facilities and improved demand with profits showing a gain from £1.65m to £2.16m.

Difficult conditions in the metal reclamation industry, which prevailed in 1977, abated during the year, leading to a considerable improvement in profitability for this side of the group.

Tace, the associated engineer-

ing company, reported a recovery in the second half of 1978, which has led to an encouraging start in the current year, Mr. Mackenzie states.

Steel Stockholding had another successful year. And United Scrap more than doubled its profits with management figures for the first months of 1979 showing a significant improvement, the chairman says.

A revaluation of group freehold and leasehold properties as at December 31, 1978, show a £3.1m surplus over book value.

Meeting, Essex Street, WC, on June 26 at 3 pm.

TO THE HOLDERS OF

## Popular Español International NV

Guaranteed Floating Rate Notes due 1981

In accordance with the provisions of the above Notes, Bankers Trust Company, as Fiscal Agent thereof, has established the Rate of Interest on such Notes for the semi-annual period ending 30th November, 1979 as eleven and one eighth per cent (11 1/8%) per annum. Interest due on such date will be payable upon surrender of Coupon No. 6.

BANKERS TRUST COMPANY, Fiscal Agent

DATED: May 25th, 1979.

### FINANCE FOR INDUSTRY TERM DEPOSITS

Deposits of £1,000-£50,000 accepted for fixed terms of 2-10 years. Interest paid gross, half-yearly. Rates for deposits received not later than 8.6.79.

Terms (years)	3	4	5	6	7	8	9	10
Interest %	11 1/2	11 1/2	11 1/2	11 1/2	12	12 1/2	12 1/2	13 1/2

Deposits to and further information from The Chief Cashier, Finance for Industry Limited, 91 Waterloo Road, London SE1 8XP (01-825 7522, Ext. 387). Cheques payable in "Bank of England, a/c FFI." FFI is the holding company for IFCG and FCI.

### SIMCO MONEY FUNDS

Return Investment Management Co. Ltd. 66 CANNON STREET, LONDON EC4A 3DF. Telephone: 01-236 1425

Rates paid to W/A 3rd June 1979

Mon.	Tue.	Wed.	Thurs.	Fri./Sun.
11.454	11.439	11.271	11.294	11.049
11.766	11.713	11.662	11.638	11.604



## BRITISH AEROSPACE AIRCRAFT GROUP

US\$14,342,832

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### LOCAL AUTHORITY BOND TABLE

Authority	Annual Interest	Life
(telephone number in parentheses)	gross pay-Interest	Minimum of sum bond
Knowsley (051 548 6555)	11 1/2	1-year 1,000 5-7
Redbridge (01-478 3020)	11	1-year 200 4-5
Redbridge (01-478 3020)	11 1/2	1-year 200 6-7
Wrekin (0952 505051)	12	maturity 1,000 2-3

This advertisement is issued in compliance with the requirements of the Council of The Stock Exchange. It does not constitute an invitation to any person to subscribe for or purchase any shares.

## MFI Furniture Group Limited

(Registered in England, No. 1410499)

Authorised	Share Capital	Issued and Fully Paid
£8,000,000	In Ordinary shares of 10p each	£6,600,000

All the issued share capital of MFI Furniture Group has been admitted to the Official List by the Council of The Stock Exchange.

Particulars of the Company have been circulated in Extel Statistical Services Limited and copies of the particulars may be obtained during business hours on any weekday (Saturdays excepted) up to and including 18th June 1979 from:-

COUNTY BANK LIMITED, 11 Old Broad Street, London EC2N 1BB  
 KEMP-GEE & CO., 20 Cophall Avenue, London EC2R 7JS


## Year of Achievement

	Year ended Dec 31 1978	Year ended Dec 31 1977	
Profit before tax	£470,000	£242,000	+ 94%
Profit after tax	£427,000	£206,000	+ 107%
Earnings per share	4.27p	2.26p	+ 89%

Action taken in 1977 to dispose of unprofitable areas of business and create a sound financial base has paid off with record profit in 1978.


We expect profit in 1979 to be another record with further growth in earnings per share.

—MICHAEL HEATHCOTE  
CHAIRMAN



### Allied Plant Group Limited

For a copy of the 1978 Report, write to the Secretary, 79 Beverley Road, Hull HU3 1XR.



## ANDELSBANKEN A/S Copenhagen

### U.S. \$30,000,000 Floating Rate Capital Notes due 1984

For the six months 4th June, 1979 to 4th December, 1979 the Notes will carry an interest rate of 11 7/8 per cent per annum.

The Notes are listed on the Luxembourg Stock Exchange

By Morgan Guaranty Trust Company of New York, London Agent Bank.

## ORD MINNETT

AUSTRALIAN INVESTMENT BANKERS

Announce the appointment of

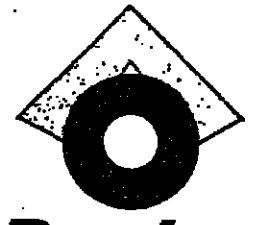
### DAVID GREGORY

AS EUROBOND MANAGER

In their London Office

Telephone: 625 7031. Telex: 887143  
 Address: One College Hill, London EC4R 2RA.

This advertisement appears as a matter of record only.



## The Korea Development Bank

### Kuwaiti Dinars 12,000,000

### 7 1/2% Bonds due 1989

(Redeemable at the option of the holder in 1984)

Issue price 99 1/4%

The National Bank of Kuwait S.A.K. Merrill Lynch International & Co.

Alahli Bank of Kuwait (K.S.C.) The Arab Investment Company S.A.A. (Riyadh)

Banque Nationale de Paris. Burgan Bank S.A.K., Kuwait.

The Commercial Bank of Kuwait S.A.K. The Gulf Bank K.S.C., Kuwait.

Hill Samuel & Co., Limited. Korea Associated Securities Inc.

The National Commercial Bank (Saudi Arabia)

The Industrial Bank of Korea K.S.C.

Also Dhabi Investment Company, American Express Bank International Group, Arab African International Bank, The Arab European Financial Management Co., S.A.K., Arab Financial Consultants Company S.A.K., Arab-Malaysian Development Bank, The Arab and Morgan Grenfell Finance Company Limited, Arab Trust Company K.S.C., B.A.I.L. (Middle East) Inc., Bankers Corp. & Co., Credit Lyonnais, Citicorp International Group, Dresdner Bank Aktiengesellschaft, European Banking Company, Euroclear, Eurosecurities Limited, Financial Group of Kuwait K.S.C., First Chicago Asia Merchant Bank Ltd., Gulf International Bank, U.S.A., Gulf Ryed Bank E.C. 1 B J International Limited, International Financial Advisors K.S.C., Korea Associated Finance Limited, Kuhn Loeb Lehman Brothers Asia, Kuwait Financial Centre S.A.K., Kuwait Foreign Trade Contracting & Investment Co. (S.A.K.), Kuwait International Investment Co. S.A.K., Kuwait Investment Company (S.A.K.), Kuwait Pacific Finance Company Limited, Manufacturers Hanover Limited, Netherland Creditbank N.V., Orion Bank Limited, Riyad Bank Limited, Sabhan Merchant Banking Corporation, Seoul, Salomon Brothers International Limited, Al Saigh Banque, Scandinavian Bank Limited, J. Henry Schroder & Co., S.A.L.

Handwritten signature or mark.



Granges in the black for first time since mid-1975

WILLIAM DULFORS in STOCKHOLM

Granges, the Swedish metal engineering group, is running a profit for the first time since the middle of 1975...

Losses at the pre-tax level totalled almost Skr 1.25bn in the three-year period 1975-78...

Posner stake in Reliance Electric

By David Lascelles in New York

MR. VICTOR POSNER, the businessman, may be on the verge of pulling off another coup...

O and K sees return to growth

ROGER BOYES in BONN

STEIN and Kappel (K), the West German engineering and shipping...

The drop in profits resulted partly from the continuing difficulties of the shipbuilding sector...

national exporter like O and K was the fall in overseas turnover...

Kaiser Steel to sell interest in Hamersley

OAKLAND — Kaiser Steel Corporation has agreed to sell its entire 28.3 per cent interest in Hamersley Holdings to Conzinc...

Kaiser said that the sale was subject to approval by the directors of both companies...

Largest Japanese makers ahead

RICHARD C. HANSON in TOKYO

Two largest computer makers chucked up sales and profit gains in the first three months of 1979...

to account for 14.6 per cent of sales. Sales of computers rose 10.4 per cent to ¥302.9bn...

such as Nippon Telephone and Telegraph, rose 11 per cent to ¥161.5bn...

CURRENCIES, MONEY and GOLD Europe under fire

COLIN MILLHAM

Interest rate war began to intensify in Europe last week as a central bank and then raised its short-term rates...

Currencies such as the Belgian franc have been on a treadmill, moving faster and faster...

the Netherlands Bank lifted its discount rate by 1/2 per cent to 7 per cent...

BASE LENDING RATES

Table listing base lending rates for various banks and currencies, including A.B.N. Bank, Allied Irish Banks, Amro Bank, etc.

CURRENCY RATES

Table showing currency rates for various countries like Argentina, Australia, Brazil, Canada, Denmark, etc.

OTHER MARKETS

Table showing market rates for various commodities and currencies like Argentina, Australia, Belgium, etc.

THE POUND SPOT AND FORWARD

Table showing pound spot and forward rates for various currencies like U.S., Canada, Netherlands, etc.

CHANGE CROSS RATES

Table showing change cross rates for various currencies like Sterling, French Franc, Italian Lira, etc.

MONY RATES

Table showing money rates for New York, Germany, and France, including Prime Rate, Fed Funds, etc.

For the convenience of readers the dates when some of the more important company dividend statements may be expected in the next few weeks are given in the following table...

Table listing company dividend statements with columns for Date, Announcement, and Stock.

RECENT ISSUES

Table listing recent issues of equities with columns for Issue Price, Latest Price, and Stock.

FIXED INTEREST STOCKS

Table listing fixed interest stocks with columns for Issue Price, Latest Price, and Stock.

"RIGHTS" OFFERS

Table listing rights offers with columns for Issue Price, Latest Price, and Stock.

BASE LENDING RATES

Table listing base lending rates for various banks and currencies, including A.B.N. Bank, Allied Irish Banks, Amro Bank, etc.

Advertisement for ABTHORPE JOKES LTD featuring a large illustration of a man and woman, with text: 'WHO WOULD YOU LIKE TO INHERIT YOUR BUSINESS, YOUR FAMILY OR THE GOVERNMENT?' and 'Equity & Law'.







INTERNATIONAL CAPITAL MARKETS

BY FRANCIS GHILES

INTERNATIONAL BONDS

Waiting for the dollar window

ILE TRADING activity in the Eurobond market remained a low ebb last week as bond buyers met in London for the 10th anniversary of the foundation of International Bond Dealers' Institutional Fund for dollar denominated securities remained strong.

Alcoa of Australia. There is widespread expectation in the market that the pace of issuing activity will increase markedly this week.

Among the latest issues, the ENT offering, which was increased from an indicated \$75m to \$100m, met with a good reception. Terms announced by the lead managers, Goldman Sachs and BNP are final and the issue, which is entirely underwritten by the managers, yields 9.55 per cent.

The second charge levelled at the CSFB tactic is that it does little to create any goodwill from other banks vis-a-vis Alcoa. Furthermore, banks which invite CSFB into the management group of issues they managed should be able to count on reciprocity.

Other banks, however, agree with CSFB. They are strongly of the opinion that if CSFB, or for that matter any other bank, has the muscle to tackle an issue on its own, all well and good. The lead manager can keep all the management fee rather than have to split it.

EUROBONDS

BY JOHN EVANS

Grey market hairs for AIBD

RUPERT HAMBRO, the coming chairman of the Association of International Bond Dealers, may consider one of the most urgent tasks to be the ending of frictions which impeded the AIBD's two-day last week conference.

AIBD that the primary and secondary markets are increasingly tending to go their separate ways, with the grey market problem perhaps a symptom of this.

The fact that some traders now publicly make markets for new issues at sizeable discounts has raised ethical problems for the primary houses.

commissions to bring bond yields more in line with the overall market. The high level of fees in the Eurobond market, compared with the New York bond market, creates the basis for pre-market transactions, they say.

As for the primary side, many consider Credit Suisse First Boston's handling of the flotation of the \$100m convertible issue of Credit Suisse and its consequent pricing tactics to be an opening shot in what may prove to be a long-running dispute over "grey" trading.

Since the mid-1970s, the large institutional investors have had an increasingly important say in the Eurobond market, and it is probably the greatest factor in persuading new issue syndicate members to share much of their underwriting concessions in the form of a discount from the issue price.

Some believe that Rupert Hambro should favour a radical solution to the grey market problem and tackle it at the root by reducing selling group commissions to bring bond yields more in line with the overall market.

Whether Mr. Hambro, as an AIBD representative, can persuade primary market participants to go along with such schemes is another matter. But his bank—Hambros—is based in both the primary and secondary Eurobond sectors. He could therefore prove the ideal choice for creating greater co-operation between the two during his next three years of office.

The latest Eurosterling entry, the £25m 12-year issue for the EIB, met with an indifferent response. It carried a coupon of 11 per cent and was priced at 99. Last Friday, the first day of trading, the bonds were quoted at 97.

U.S. BONDS

BY DAVID LASCELLES

Some nerves begin to snap

IT WAS the merry month of May for some. The bond markets put on one of their strongest rallies in this interest rate cycle as signs multiplied that the economic boom was petering out. But last Thursday nerves began to snap and by the end of the week the market had given up a lot of its gains.

Most bonds managed to sustain a net advance on the week though. Yields on top grade, long-term corporate bonds narrowed by about five basis points (Bell System bonds closed with yields around 9.3 per cent). Treasury securities were more mixed; yields on short-term issues shed two or three basis points, but longer dated issues widened slightly.

The surge was fuelled by a series of data suggesting that the consumer had finally begun to get back on his spending. Car and other durable sales are down, so are factory orders. Last week also brought news that the leading economic indicators had dropped 3.3 per cent, their sharpest fall for a long time.

Chase comments: "While these relationships are by no means conclusive evidence that the recent rally will be completely erased, they certainly justify a cautious attitude." Others take a more pragmatic view. Alan Lerner, economist at Bankers Trust, doubts that the recession has yet arrived. "The gradual ebbing of economic activity in tandem with the gasoline shortage has heightened expectations of a recession, but the timing still remains in doubt," he says.

FT INTERNATIONAL BOND SERVICE

Table with columns for DOLLAR, TSCHIE MARK, and SS FRANC, listing various bond issues with their respective yields and prices.

Advertisement for Canadian Imperial Bank of Commerce, featuring a logo and text: 'Can. \$100,000,000', '10.10% Debentures', 'Price: 100 and accrued interest', 'To be dated June 14, 1979', 'To mature June 15, 1984'.



# FT Monthly Survey of Business Opinion

Statistical Material Copyright Taylor Nelson Group Ltd.

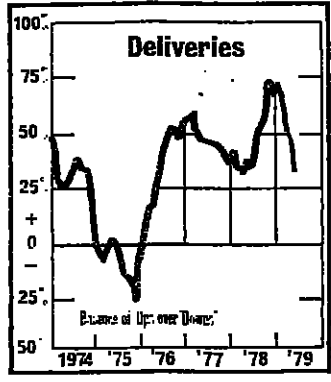
## GENERAL OUTLOOK

### Election boosts confidence

THE CONSERVATIVE victory in the general election was the main reason for a further rise in confidence among businessmen last month. There was a sharp improvement in the level of optimism over both the prospects for the UK economy and the general business outlook.

Last month's survey included new interviews with companies in the electrical engineering sector, consumer durables and stores and consumer services companies, who were last covered in January.

The improvement in the two indices follows a steady fall from the middle of 1978 and a slight recovery in April. As well



that wage increases had not been as great as feared and that last January's expectations had been affected by the bad weather.

All three sectors were less inclined to report increased deliveries than they had been last January, so this index continued the fall that started in that month.

The consumer durables group was less hopeful of increasing its exports over the next 12 months than at the beginning of the year, although the stores sector was more hopeful. On an export-weighted basis the index covering prospects continued the downward movement that began in September.

as the change of Government and other factors mentioned were

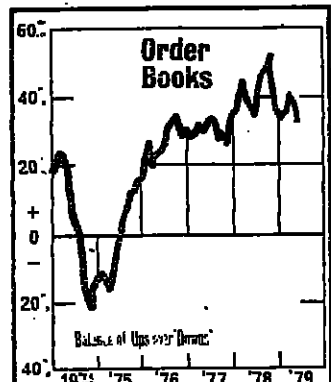
## ORDERS AND OUTPUT

### Pick-up in demand

THERE WERE more signs of a pick-up in demand last month, with a further rise in the index for new orders over the previous four-month period.

In spite of this, expectations for orders over the next 12 months fell back, with both the electrical engineering and consumer durables sector less inclined to expect increases in their order books than they had been last January.

Among the reasons given by businessmen in the stores sector for the pick-up in orders was a buying surge by anticipated increases in VAT. Further factors helping orders were in-



expected improvement in UK tourism after last year's downturn.

Although the two manufacturing sectors of electrical engineering and consumer durables expected greater increases in their output over the next 12 months, the stores sector was more inclined to say it expected sales to rise by less than 10 per cent than it had been last January.

As a result, the index for the median expected increase in turnover over the next 12 months, which had been rising, dropped back from 7.4 to 6.9 per cent.

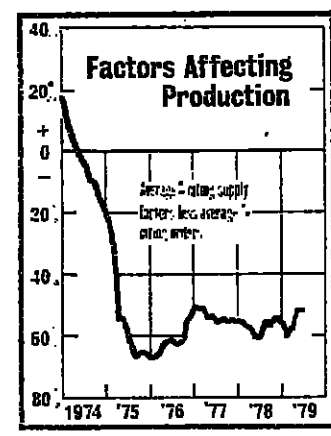
increases in the number of outlets or agents, the weather and an

## CAPACITY AND STOCKS

### Further below plan

THE INDEX covering the extent to which industry was working to capacity lost the ground it had regained last month. This was because the electrical engineering group was more inclined to say it was operating at below planned output levels than it had been last January.

There was a slight increase in the level of expected stocks for the next 12 months, mainly in raw materials and work in progress. However, there was no change in the index covering the level of stocks in relation to current sales trends.



Demand remained the more important factor in determining the level of output. There was no change overall in this index, which had been moving slightly towards citing supply factors in the previous two months.

Fewer companies said output was affected by factors associated with manual labour or executive staff, while there was some increase in the number which mentioned shortages of components. There was also a slight reduction in the number of companies which mentioned a shortage of export orders as a constraint.

## CAPACITY WORKING

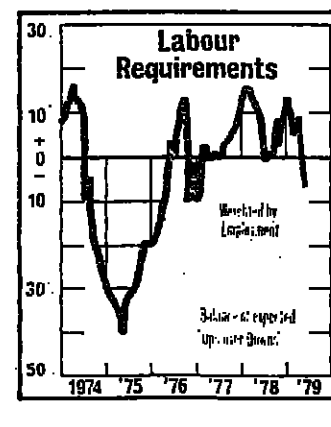
	4 monthly moving total				May 1979			
	Feb.-May %	Jan.-Apr. %	Dec.-Mar. %	Nov.-Feb. %	Elect. Eng'g %	Consumer Durables %	Stores %	Stores %
Above target capacity	13	10	12	9	—	5	33	—
Planned output	61	67	62	70	67	58	53	—
Below target capacity	26	22	25	19	33	37	14	—
No answer	—	1	1	2	—	—	—	—

## INVESTMENT AND LABOUR

### Decline in jobs expected

THE INDEX for labour requirements dropped back for the second consecutive month in May, with all three sectors less inclined to expect their labour forces to increase over the next 12 months.

The index now shows quite a substantial excess of companies saying they expect their labour force to decline over those who say they expect them to increase. Companies were more inclined to mention product demand as affecting the number of employees than the structure of labour supply factors. In particular there was less emphasis on the potential cost of reduc-



dancy payments or other aspects of employment legislation.

The survey comments that this is exactly the trend one would expect under the Conservative Government's policy. "The present shift of opinion may, of course, simply be due to a number of respondents' awareness of this fact."

Investment plans were little changed. While the electrical engineering group was more inclined to say that its capital expenditure would decrease over the next 12 months, this was balanced by a more optimistic outlook from the stores sector.

## COST AND PROFIT MARGINS

### Wage expectations rise

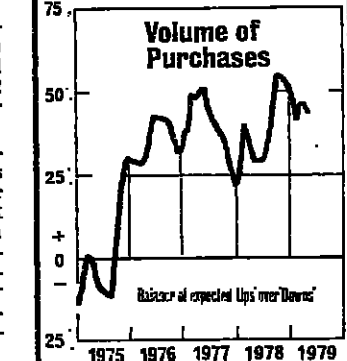
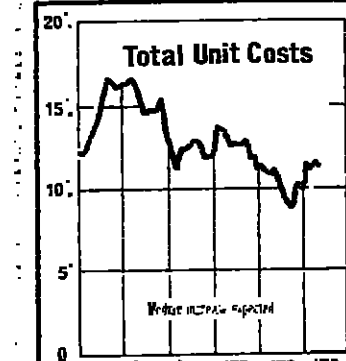
COMPANIES were more inclined to expect higher wages costs than before, although they expected smaller increases

stores sectors were more inclined to expect increases of 15 per cent or more than previously. This pushed up the median expected wage increase from 12.5 to 12.8 per cent.

The drop in the median expected rise in unit costs—from 11.5 to 11.1 per cent—reflected lower estimates for the next 12 months in both the consumer durables and stores groups.

Both the electrical engineering and consumer durables groups were less optimistic about improving their profit margins than in January, with customer resistance to price increases, higher wage levels, increased costs and the difficulty of securing productivity improvements mentioned as factors.

These surveys, which are carried out for the Financial Times by the Taylor Nelson Group, are based upon extensive interviews with top executives. Three sectors and some 30 companies are covered in turn every month. They are drawn from a sample based upon the



## GENERAL BUSINESS SITUATION

Are you more or less optimistic about your company's prospects than you were four months ago?	4 monthly moving total				May 1979		
	Feb.-May %	Jan.-Apr. %	Dec.-Mar. %	Nov.-Feb. %	Elect. Eng'g %	Consumer Durables %	Stores %
More optimistic	40	32	31	31	46	21	60
Neutral	21	33	35	43	32	20	40
Less optimistic	39	35	34	26	22	59	—

## EXPORT PROSPECTS (Weighted by Exports)

Over the next 12 months exports will be:	4 monthly moving total				May 1979		
	Feb.-May %	Jan.-Apr. %	Dec.-Mar. %	Nov.-Feb. %	Elect. Eng'g %	Consumer Durables %	Stores %
Higher	61	57	61	67	73	63	56
Same	23	34	30	22	—	1	40
Lower	16	9	9	10	27	36	—
Don't know	—	—	—	1	—	—	4

## NEW ORDERS

The trend of new orders in the last 4 months was:	4 monthly moving total				May 1979		
	Feb.-May %	Jan.-Apr. %	Dec.-Mar. %	Nov.-Feb. %	Elect. Eng'g %	Consumer Durables %	Stores %
Up	61	59	50	49	46	63	77
Same	18	13	14	16	54	—	17
Down	13	15	15	14	—	32	—
No answer	8	13	21	21	—	5	6

## PRODUCTION/SALES TURNOVER

Those expecting production/sales turnover in the next 12 months to:	4 monthly moving total				May 1979		
	Feb.-May %	Jan.-Apr. %	Dec.-Mar. %	Nov.-Feb. %	Elect. Eng'g %	Consumer Durables %	Stores %
Rise over 20%	7	9	6	3	—	—	—
Rise 15-19%	2	8	8	11	2	—	3
Rise 10-14%	25	20	19	15	32	53	13
Rise 5-9%	22	20	21	21	33	10	43
About the same	38	37	36	31	33	11	30
Fall 5-9%	1	1	1	1	—	—	—
No comment	5	5	9	18	—	26	11

## STOCKS

Raw materials and components over the next 12 months will:	4 monthly moving total				May 1979		
	Feb.-May %	Jan.-Apr. %	Dec.-Mar. %	Nov.-Feb. %	Elect. Eng'g %	Consumer Durables %	Stores %
Increase	44	41	42	36	56	26	67
Stay about the same	45	47	42	45	33	64	30
Decrease	8	8	8	7	11	10	—
No comments	3	4	8	12	—	—	3

Manufactured goods over the next 12 months will:	4 monthly moving total				May 1979		
	Feb.-May %	Jan.-Apr. %	Dec.-Mar. %	Nov.-Feb. %	Elect. Eng'g %	Consumer Durables %	Stores %
Increase	30	30	32	25	24	27	33
Stay about the same	45	43	39	47	22	42	61
Decrease	9	9	8	7	—	21	—
No comments	16	18	21	21	54	10	6

## FACTORS CURRENTLY AFFECTING PRODUCTION

	4 monthly moving total				May 1979		
	Feb.-May %	Jan.-Apr. %	Dec.-Mar. %	Nov.-Feb. %	Elect. Eng'g %	Consumer Durables %	Stores %
Home orders	78	76	81	79	78	16	70
Export orders	50	54	60	67	54	37	17
Executive staff	8	16	16	19	11	—	—
Skilled factory staff	27	26	27	27	76	64	—
Manual Labour	8	14	10	12	—	10	—
Components	6	2	3	4	43	11	—
Raw materials	11	11	12	14	—	11	6
Production capacity (plant)	13	13	11	4	—	—	17
Finance	—	1	1	1	—	—	—
Others	9	10	10	7	—	5	13
Labour disputes	27	27	18	26	22	26	37
No answer/no factor	6	3	3	5	—	26	13

## LABOUR REQUIREMENTS (Weighted by Employment)

Those expecting their labour force over the next 12 months to:	4 monthly moving total				May 1979		
	Feb.-May %	Jan.-Apr. %	Dec.-Mar. %	Nov.-Feb. %	Elect. Eng'g %	Consumer Durables %	Stores %
Increase	17	21	26	27	—	9	37
Stay about the same	58	38	57	51	100	64	50
Decrease	24	20	17	22	—	27	13

## CAPITAL INVESTMENT (Weighted by Capital Expenditure)

Those expecting capital expenditure over the next 12 months to:	4 monthly moving total				May 1979		
	Feb.-May %	Jan.-Apr. %	Dec.-Mar. %	Nov.-Feb. %	Elect. Eng'g %	Consumer Durables %	Stores %
Increase in volume	50	52	53	46	15	58	50
Increase in value but not in volume	13	9	6	8	15	14	33
Stay about the same	14	19	23	23	29	—	17
Decrease	22	20	16	16	41	13	—
No comment	1	—	2	7	—	15	—

## COSTS

Wages rise by:	4 monthly moving total				May 1979		
	Feb.-May %	Jan.-Apr. %	Dec.-Mar. %	Nov.-Feb. %	Elect. Eng'g %	Consumer Durables %	Stores %
5-9%	10	14	14	19	—	10	14
10-14%	46	60	61	55	78	36	50
15-19%	18	16	14	11	22	—	36
20-24%	1	1	1	1	—	—	—
No answer	5	12	10	14	—	54	—

Unit cost rise by:	4 monthly moving total				May 1979		
	Feb.-May %	Jan.-Apr. %	Dec.-Mar. %	Nov.-Feb. %	Elect. Eng'g %	Consumer Durables %	Stores %
0-4%	3	1	1	1	—	—	14
5-9%	26	25	26	26	46	42	27
10-14%	45	47	46	45	22	32	53
15-19%	11	11	10	11	11	—	3
Same	3	3	3	3	—	—	—
Decrease	4	4	4	—	—	—	—
No answer	8	9	10	14	21	26	3

## PROFIT MARGINS

Those expecting profit margins over the next 12 months to:	4 monthly moving total				May 1979		
	Feb.-May %	Jan.-Apr. %	Dec.-Mar. %	Nov.-Feb. %	Elect. Eng'g %	Consumer Durables %	Stores %
Improve	34	37	43	40	54	26	23
Remain the same	44	41	35	47	44	31	77
Contract	20	20	20	12	2	31	—
No comment	2	2	2	1	—	12	—

**Tronoh Mines Malaysia Berhad**  
(Incorporated in Malaysia)  
Extracts from the Statement by the Chairman, Encik Junus Sudin, for the year ended 31st December, 1978.

### Past Year's Performance

Total production of the company's subsidiaries was 39,824 piculs which exceeded the previous year's performance by 2,671 piculs.

As a result of the higher tin price and production, the mining profit recorded by the subsidiaries at \$12,084,000 was 38% above the previous year's level.

The share of profits of associated companies fell from the 1977 level, although not to the extent predicted, again because of the high tin price. However, the reduction was more than offset by the increase in the subsidiaries' mining profit and in interest receivable. The group's profit before taxation and extraordinary items was therefore, \$24,497,000, a rise of \$1,989,000 or 9% over the previous year.

The profit attributable to the company, after deducting minority interest, was \$8,641,000 compared with \$7,255,000 for the previous year. The earnings per share before extraordinary items were 82 cents (1977: 83 cents).

### Dividend

An interim dividend of 25 cents per share, less tax at 40%, for the year ended 31 December 1978 was paid on 3 November 1978.

Your board feels it would not be prudent for the company to pay any further dividend in respect of the year ended 31 December 1978. However, an interim dividend of 30 cents per share, less tax at 40%, for the year ended 31 December 1979 has been declared payable on 22 June 1979 to shareholders on the registers on 8 June 1979. In addition to this interim dividend, it is expected that the company's usual pattern for paying dividends will be maintained for the financial year ending 31 December 1979.

### Projections for Current Year

It is expected that the total production of the company and its subsidiary, Bidor Malaya Tin Sandirian Berhad for the current year will fall below that achieved in 1978. However, group profit will not be materially affected because the contribution by associated companies to profit should be maintained at the level that prevailed in 1978.

### Developments During the Year

Consequent upon the liquidation of Tronoh Mines Limited, the company took over all the assets and became legally responsible for all the liabilities of that company with effect from 1 January 1979.

Associated Mines (Malaya) Sandirian Berhad, a company which is wholly owned by your company, effectively ceased operations during 1978 and sold its fixed assets. In the South Selangor Project, there are positive indications that a joint venture agreement will be concluded before the end of this year.

Following the signing of a joint venture agreement for the Tapah Road Project in October 1978, Timah Dermawan Sandirian Berhad, whose shareholders are Perak State Development Corporation (30%), Malaysia Mining Corporation Berhad (40%) and the company (30%), was set up to operate the project. Production from Timah Dermawan is expected to commence in 1981.

It was reported in my statement last year that the company had not been able to secure conversion to mining title of a part of an area at Ayer Kuning, within which sufficient reserves had been proved that would extend the life of one of the dredges by 10 years. Appeals have been made to the authorities for reconsideration of the company's application and your board is hopeful that a favourable solution will emerge in view of the close rapport the company has with the state authorities.

An attractive offer was received during the year for the assets owned by the Bidor Malaya Tin Sandirian Berhad joint venture were of the unanimous view that the offer should be accepted and as a result, the joint venture was dissolved in November 1978. The project managers have since received the initial proceeds, of which your company's share amounts to US\$977,000. In the event of successful conversion by the purchaser of the outstanding mining lease applications your company will receive a further US\$217,000.

15 May 1979

Copies of the Report and Accounts and Chairman's Statement can be obtained from the Registrars, Charter Consolidated Limited, P.O. Box 102, Ashford, Kent TN24 5EQ and 40 Holborn Viaduct, London EC1P 1AJ.











Journalist

AUTHORISED UNIT TRUSTS

Table of authorized unit trusts including names like Unit Tr. Mgrs. (a), (b), (c), and various fund names with their respective details.

Table of unit trusts including names like Mutual Unit Trust Mgrs. (a), (b), (c), and various fund names with their respective details.

Table of unit trusts including names like Tower Unit Trust Mgrs. Ltd., and various fund names with their respective details.

OFFSHORE AND OVERSEAS FUNDS

Table of offshore and overseas funds including names like Alexander Fund, Kemp-Ge Management, Jersey Ltd., and various fund names with their respective details.

INSURANCE AND PROPERTY BONDS

Table of insurance and property bonds including names like Abbey Life Assurance Co. Ltd., and various insurance and bond products with their respective details.

NOTES: Prices do not include a premium, except where indicated, and are in prices unless otherwise indicated.







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INDUSTRIALS—Continued

Table of industrial stocks including companies like British Petroleum, Shell, and ICI, with columns for stock name, price, and other financial metrics.

INSURANCE—Continued

Table of insurance stocks including companies like Lloyds, Norwich Union, and Royal Indemnity, with columns for stock name, price, and other financial metrics.

PROPERTY—Continued

Table of property stocks including companies like British Land, Guinness, and Anglo Irish, with columns for stock name, price, and other financial metrics.

INVESTMENT TRUSTS—Cont.

Table of investment trusts including companies like British Venture, British Venture, and British Venture, with columns for stock name, price, and other financial metrics.

FINANCE, LAND—Continued

Table of finance and land stocks including companies like British Venture, British Venture, and British Venture, with columns for stock name, price, and other financial metrics.

DC logo and text: 'design and build cost effective developments for industry and commerce'.

MINES—Continued

Table of mine stocks including companies like Anglo American, Anglo American, and Anglo American, with columns for stock name, price, and other financial metrics.

LEISURE

Table of leisure stocks including companies like British Venture, British Venture, and British Venture, with columns for stock name, price, and other financial metrics.

MOTORS, AIRCRAFT TRADES

Table of motor and aircraft trade stocks including companies like British Venture, British Venture, and British Venture, with columns for stock name, price, and other financial metrics.

Commercial Vehicles

Table of commercial vehicle stocks including companies like British Venture, British Venture, and British Venture, with columns for stock name, price, and other financial metrics.

Components

Table of component stocks including companies like British Venture, British Venture, and British Venture, with columns for stock name, price, and other financial metrics.

Garages and Distributors

Table of garage and distributor stocks including companies like British Venture, British Venture, and British Venture, with columns for stock name, price, and other financial metrics.

NEWSPAPERS, PUBLISHERS

Table of newspaper and publisher stocks including companies like British Venture, British Venture, and British Venture, with columns for stock name, price, and other financial metrics.

PAPER, PRINTING ADVERTISING

Table of paper, printing, and advertising stocks including companies like British Venture, British Venture, and British Venture, with columns for stock name, price, and other financial metrics.

SHIPPING

Table of shipping stocks including companies like British Venture, British Venture, and British Venture, with columns for stock name, price, and other financial metrics.

SHOES AND LEATHER

Table of shoe and leather stocks including companies like British Venture, British Venture, and British Venture, with columns for stock name, price, and other financial metrics.

SOUTH AFRICANS

Table of South African stocks including companies like British Venture, British Venture, and British Venture, with columns for stock name, price, and other financial metrics.

TEXTILES

Table of textile stocks including companies like British Venture, British Venture, and British Venture, with columns for stock name, price, and other financial metrics.

TOBACCO

Table of tobacco stocks including companies like British Venture, British Venture, and British Venture, with columns for stock name, price, and other financial metrics.

TRUSTS, FINANCE, LAND

Table of trusts, finance, and land stocks including companies like British Venture, British Venture, and British Venture, with columns for stock name, price, and other financial metrics.

FINANCE

Table of finance stocks including companies like British Venture, British Venture, and British Venture, with columns for stock name, price, and other financial metrics.

DIAMOND AND PLATINUM

Table of diamond and platinum stocks including companies like British Venture, British Venture, and British Venture, with columns for stock name, price, and other financial metrics.

CENTRAL AFRICAN

Table of Central African stocks including companies like British Venture, British Venture, and British Venture, with columns for stock name, price, and other financial metrics.

TINS

Table of tin stocks including companies like British Venture, British Venture, and British Venture, with columns for stock name, price, and other financial metrics.

COPPER

Table of copper stocks including companies like British Venture, British Venture, and British Venture, with columns for stock name, price, and other financial metrics.

MISCELLANEOUS

Table of miscellaneous stocks including companies like British Venture, British Venture, and British Venture, with columns for stock name, price, and other financial metrics.

GOLDS EX-\$ PREMIUM

Table of gold stocks including companies like British Venture, British Venture, and British Venture, with columns for stock name, price, and other financial metrics.

NOTES

Notes section containing various financial notices, company announcements, and market commentary.

REGIONAL MARKETS

Table of regional market data including stock prices and indices for various international markets.

OPTIONS

Table of options data including call and put option prices for various stocks.

3-month Call Rates

Table of 3-month call rates for various currencies and markets.

INSURANCE

Table of insurance stocks including companies like British Venture, British Venture, and British Venture, with columns for stock name, price, and other financial metrics.



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# Parsons technology deal seen as breakthrough

BY PHILIP BASSETT, LABOUR STAFF

CLERICAL WORKERS at NEI Parsons, the North-East's major engineering group, have reached agreement on the introduction of microelectronic technology which both the company and union officials regard as a breakthrough.

The agreement with the Association of Professional, Executive, Clerical and Computer Staff, includes a no-redundancy guarantee as a result of the introduction of microelectronic technology.

The deal, which covers about 600 clerical staff in C. A. Parsons, Grubb Parsons, GP Instrumentation and RP Automation, is seen by APEX officials as a blueprint for similar agreements throughout the country.

It is closely in line with the guidelines on the introduction of new technology, on guarantees of status and earnings as well as job security. Negotiations started more than 12 months ago.

The union has agreed to co-operate with the introduction of Visual Display Units for stock control, purchasing and other clerical work and other systems such as desk top data entry devices and word processors. The group has had VDUs installed for some time, but they have been kept under wraps until an agreement was reached.

As well as the job security guarantee, full discussions aimed at redeployment will take place with the union if an excess of labour develops in any particular area. The group's job evaluation scheme will be redesigned to recognise changes in responsibility from the introduction of the new equipment, though no clerical staff will be downgraded as a result.

Particular care will be taken to avoid any risks to health and safety from the operation of the VDUs, with operators in constant attendance taking a 20-minute break after every hour's VDU work.

A training scheme for the initial 20 operators and others to follow will be set up, with payments of £20 for attendance.

The agreement is indefinite, with a joint management and union committee being set up to monitor and control introduction of further systems.

NEI Parsons said the deal was a "breakthrough" and that the group was "very pleased" to have concluded it after such protracted negotiations. Mr. John Creaby, northern area organiser of APEX, said the agreement showed an acceptance of new technology on the trade union's terms.

# Pope stresses Europe's unity despite rifts

BY ANTHONY ROBINSON, EAST EUROPE CORRESPONDENT

IN A clear message of encouragement to Roman Catholics throughout Eastern Europe, Pope John Paul declared the "spiritual unity of Christian Europe" in spite of political divisions yesterday.

At a ceremony in Gniezno, the shrine in Western Poland dedicated to St. Adalbert, the 10th century Czech-born martyr, and made more poignant by the absence of Mr. Frantisek Tomasek the Czech Prime Minister, who was refused permission to visit Poland by the Czechoslovakian authorities, the Pope underlined the significance of his election as the first Slav Pope.

"Is it not Christ's will... that this Polish Pope, this Slav Pope, should at this present moment manifest the spiritual unity of Christian Europe?" he asked. "Yes, it is Christ's will," he added forcefully, and went on to name all the Slav peoples converted to Roman Catholicism.

By emphasising the durability of the Christian faith, the Pope appealed directly to the faithful throughout Eastern Europe.

He gave a similar message to the youth of Poland at an early morning Mass outside the Church of St. Anne in Warsaw before departing from Victory Square for Gniezno, in a white helicopter.

Strength was not to be measured by physical force but by the force of the spirit, he told thousands of cheering students and young people, whom he called the future of Poland.

Thousands greet Pope, Page 2

# U.S. view on shipping 'makes normal sea trade impossible'

BY IAN HARGREAVES, SHIPPING CORRESPONDENT

THE DECISION of a U.S. federal Grand Jury to indict criminally seven trans-Atlantic shipping groups was attacked yesterday as "the product of a total lack of a coherent shipping policy in the U.S."

Mr. David Ropner, president of the General Council of British Shipping, said that the decision reflected the Administration's one-sided view of shipping matters, which was making normal sea trade with the U.S. commercially impossible.

Under UK law, none of the activities investigated by the Grand Jury would be considered illegal, he said.

The indictments, reported in late editions of Saturday's Financial Times, concern an alleged conspiracy between the companies illegally to fix prices on North Atlantic freight services between 1971 and 1975.

Seven shipping groups, three of them Europe-based, were handed criminal indictments and 13 company executives accused of misdemeanours.

The decisions are likely to cost each group named \$1m and each individual \$50,000, but the exact sums have yet to be determined by negotiation between the accused and the Department of Justice. They must then be ratified by the courts.

The groups involved are Hapag Lloyd of West Germany, Atlantic Container Line (comprising companies from the UK, France, Holland and Sweden); Dart Containerline (with companies from the UK, Belgium and Taiwan); Sealand Services, Seatrain, Farrell Lines and United States Lines.

Thirteen individuals are also named on misdemeanor indictments. They include two Britons, Mr. Philip Bates, chairman of Atlantic Container, and Mr. David Hall, formerly of Dart; two Germans, a Belgian, a Swede and six Americans.

Atlantic Container of Southampton, said last night that it would be studying the Grand Jury's ruling today and could not comment at this stage.

Britain and the other European Governments affected by the decision take a serious view of this latest twist in a long-running battle between the U.S. and others over the legality of the so-called "closed conference" system for fixing prices and levels of service in liner shipping.

Mr. John Nott, Trade Secretary, said on Friday that the Government would review its policy on co-operation with non-maritime anti-trust investigations in Britain.

The shipping industry is outraged by the prosecution, but sees one chink of light in the failure of the U.S. Justice Department to couple with the indictments a statement about future regulation of shipping on the North Atlantic.

That, it is hoped, will pave the way for a fruitful resumption of talks between the U.S. and the 13 members (Europe plus Japan) of the Consultative Shipping Group, which are to re-open later this year.

# Iran development cutback threatens losses of £19bn

BY ANDREW WHITLEY IN TEHRAN

WESTERN and Japanese concerns stand to lose nearly \$35bn (£19bn) on civil projects in Iran which have been halted or cancelled as a result of the revolution. Defence contracts and smaller civil jobs probably double that amount.

Iran has been described by one observer as an "industrial cemetery" with hundreds of unfinished or unusable development projects littered across the country—the remnants of the Shah's grand design for making Iran the world's tenth industrial power.

Work on virtually all projects came to an end before the Shah's departure because contractors were not paid. The Government intends formally to cancel many of them, despite the enormous sums already spent.

In other cases completed schemes, such as one of the world's largest sugar plants, are standing idle, while other projects seem destined to become white elephants because of the cancellation of schemes on which they are dependent.

The arrival of a puritanical regime committed to social justice and little interested in economic development has meant the cancellation or drastic scaling down of civilian projects ranging from nuclear power stations to luxury housing and the electrification of railway lines. Defence projects are being subjected to even bigger cuts.

In Tehran alone, four projects—an international airport, an underground railway, a new city centre and an unfinished township on the outskirts, together valued at \$5.3bn—are almost certain to be scrapped.

Only the township of Farahzad may complete work already in hand.

The head of the Atomic Energy Organisation, Mr. Fereidun Sahab, said yesterday that the future of two West German nuclear plants, now nearing completion at Bushire on the Gulf, was to be debated by a top-level commission.

Independent estimates put the likely final cost of the two 1200 megawatt plants at \$6.92bn, though Kraftwerk Union, who still have 400 men on site out of their original expatriate labour force of 3,000, are said to be arguing they should cost no more than \$5.34bn.

In this state of limbo, however, some clear indicators are emerging. Although no formal decision has been taken on a gas pipeline to the Soviet Union known as IGAT 2, the French consortium, Spie-Capag, working on the laying of one stage, have been told to go home.

Among the few projects thought almost certain to continue are the country's copper mines at Sar Cheshmet, the \$3.3bn Iran-Japan petrochemical complex at Bandar Shapur, and two steel mills at Bandar Abbas and Ahwaz.

The rest represent what a foreign diplomat here recently described as a waste of national resources and energy unprecedented anywhere.

Other projects are held up by disputes over unpaid progress payments, curbs on the number of foreigners allowed to work in Iran and the stranglehold of worker committees on foreign companies. Many foreign managements are being held hostage by workers.

The Government is insisting that back payments will not be made until companies sign a document waiving all claims arising out of the revolutionary turmoil. Companies are having to decide whether to keep a low profile or to cut their losses and get out.

Most foreign contractors have still to be told that their projects, nurtured over many years, are definitely to be cancelled. Oil company board resigns, Page 2; Industrial projects, Page 3

# THE LEX COLUMN Money rate war tests EMS

Continental Western Europe is going through a bout of good old-fashioned interest rate competition; I raise my rates for domestic policy reasons, you put yours up to protect your currency. The sharp rise in oil prices is putting the European Monetary System under pressure as early as even the pessimists can have supposed, and although countries were meant to take thorough-going financial policy action to keep their currencies in the system, the interest rate hike is an older and more familiar remedy.

To judge by the orgy of upward adjustments in rates early last week the Bundesbank's decision to put up its Lombard rate to 5 1/2 per cent had been well leaked to other central banks. The Germans are putting their domestic inflation policy, which requires a strong mark, before the fortunes of the EMS. Bundesbank dollar sales in the first part of this year had already pushed the mark steadily up the EMS, and now if the dollar comes under pressure as the U.S. trade deficit widens, the mark will as usual be the chief beneficiary among the EMS currencies. So the Belgians and Dutch have had to raise their Bank Rates, and the Bank of France found itself raising its money market intervention rates three days in a row in order to keep up with a rising market and prevent the French banks running a profitable position on bills discounted at the central bank. The Danes, who have taken no action, have seen their currency crash from near the top of the EMS to the bottom.

**Realignment**

Because today is a holiday throughout Continental Europe and monetary authorities are notoriously prone to take decisions on public holidays, there has been some speculation that a realignment of the float currencies is imminent. A change in the parity of, say, the Belgian franc against the mark would not be disastrous for the system as a whole, although the Belgians, with wage costs indexed to inflation, would presumably resist it. But a change in the mark/French franc rate after only three months of official operation would look very bad.

The French franc is not itself embarrassingly placed in the EMS, but this is very largely because French exchange controls make it easy for the authorities to protect the spot

are due to be finalised on June 14, just two days after the Budget.

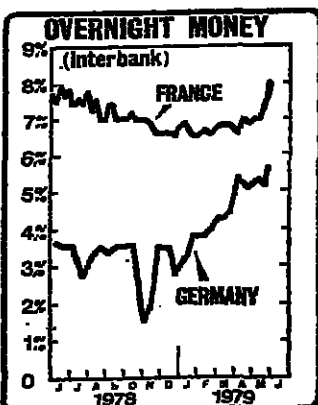
The sale will not soak up a lot of cash. STC as a whole might have a stock market value of very roughly £160m, which would make the 15 per cent minority worth a bit over £20m. All the same, the listing of the Post Office's third big supplier (along with Plessey and GEC) will create a lot of investment interest, not because STC seems to be approaching a turning point in its profits history.

**Rationalised**

The group made £26.9m pre-tax in 1978 on sales of £374m, and its record over the past five years has been unimpressive. But over that period, STC has substantially rationalised its telecommunications business, cutting the workforce from 21,000 to 13,000 in the process, and it has also been investing heavily in product development. It took the design lead on the TXE4 semi-electronic switching system, and as a result has received a very large proportion of the orders placed for this system so far. GEC and Plessey are now playing an increasing part in the TXE4 programme, but STC claims that its share of Post Office business is likely to settle down at around a third, compared with only about a fifth a few years ago.

Although its development programme is not yet complete, profit are now beginning to shift upwards. As a guide, the prospectus forecast could indicate a pre-tax rise of roughly a fifth this year, which would be in line with the anticipated sales growth to around £450m. The development of the System X digital switching system could throw the whole game open again, but in present forecasts System X is not going to start taking a big share of the network until the end of the 1980s.

So the offer for sale is likely to go well; the prospective p/e, fully taxed, may only just be in double figures. Of course ITT is not making the sale because it needs the money—the 15 per cent disposal is the least it could get away with under stock exchange practices. Nor is it likely to want its interest to be diluted much, despite its suggestion on Friday that STC's paper could be used as bid currency. The prime reason for the disposal is the political value of a local minority—an approach which ITT has already tried elsewhere in Europe.



# NEDC talks may clarify Tory stand on strategy

BY HAZEL DUFFY, INDUSTRIAL CORRESPONDENT

A MEETING of the National Economic Development Council on Wednesday—the first since the Conservatives took office—could clarify Government attitude to the industrial strategy exercise.

The meeting will be chaired by Sir Geoffrey Howe, the Chancellor, and will be attended by Sir Keith Joseph, Mr. James Prior, and Mr. John Nott.

The Government has made no reference to its attitude towards NEDC as a forum for discussion on economic and industrial problems. But it will have a chance to comment on the value of the industrial strategy exercise initiated by the previous government, when discussing a paper which has been submitted by the National Economic Development Office.

After setting out general economic indicators both for the UK and worldwide, the paper charts the familiar performance of British industry over the past 10 years.

It points out that, although the decline in the UK's share of world exports by manufacturing industry has stabilised since 1974, both the volume and value of imported manufactured goods has grown over the past five years, and they are taking a higher proportion of the home market.

Part of the paper also discusses the problems of specific industries, which are based mainly on the work that has been done in the sector working parties.

Also on the agenda is a progress report from the Department of Employment, which will be given by Mr. Prior, on efforts in the construction engineering industry to reach a national agreement on pay and industrial relations procedure.

The report indicates that progress is being made. It is hoped that there will be improvements to productivity and completion dates on large industrial construction sites.

**Petrol plea for holidaymakers**

CROMER Chamber of Trade, Norfolk, is calling for petrol vouchers to be issued to holidaymakers to ensure that they get enough fuel to return home safely. Many garages in East Anglia are selling to regulars only.

# Continued from Page 1 Engineers

workers last month rejected a deal worth about 14 per cent by three to one.

Power workers' leaders will meet representatives of the Electricity Council, also on Thursday.

The industry's unofficial shop stewards' committee has called on negotiators to give 21 days' notice of industrial action if no progress is made, but union officials seemed confident yesterday that further new money would be found.

Power workers last month rejected by postal ballot an offer that would have provided between £4.60 and £9.25 a week extra and consolidation of £3.50 in supplements.

Union officials said yesterday, though, that there was a misunderstanding during the ballot on the consolidation of the supplements; and that the negotiations this week were likely to clear that up.

Improvement of differentials under a re-grading exercise was also expected. One official said that after informal talks last week there was an understanding and appreciation of the size of the postal ballot rejection. "Both the board members and the national trade union officials appreciate that some changes will have to be made in the offer."

# Thatcher set to call for EEC reforms

BY PHILIP RAWSTORNE

MRS. MARGARET Thatcher is expected to reassert the Government's demands for EEC reforms when she visits Paris tomorrow for talks with President Giscard d'Estaing.

Making her first visit to the Continent as Prime Minister three days before the European elections, Mrs. Thatcher intends to renew the Tory commitment to membership and development of the Common Market while warning that the Government will be resolute in its defence of British interests.

Mrs. Thatcher will tell the French President—as she told Herr Schmidt, the West German Chancellor, last month—that Britain will not be "a soft touch" in negotiations.

She will make it clear that the Government will be seeking the Common Agricultural Policy reforms and a fisheries agreement which recognises Britain's special position.

The Prime Minister will stress the need to ease the burden of Britain's contribution to the EEC budget—much of which, she told a party Euro rally in Birmingham at the weekend, could be used to cut income tax at home.

Mrs. Thatcher, who will preside over the Tory Party's final election press conference on Wednesday, said that her aims in Europe would be the same as those at Westminster. Lower public spending and taxes, more competition and less bureaucracy.

Appealing for a massive turnout and Conservative vote, Mrs. Thatcher said that British Tory MPs could become the largest single national group on the new Parliament and ensure a majority for the Centre Right parties.

The Tory campaign now appears set to capture nearly 60 of Britain's 81 seats.

Mr. Edward Heath, the former Prime Minister, who by polling day will have addressed 35 meetings in almost as many constituencies, said at the weekend, that Labour's only use for the disastrous results of their policies over the last five years.

But Mr. Anthony Wedgwood Benn said in Glasgow that Labour MPs would be needed at Strasbourg to work for a new framework of co-operation in Europe, not one based on a treaty which enshrined the principles of capitalism and removed the political rights of working people.

Mr. Benn will preside at Labour's election press conference today.

# FT Monthly Survey of Business Opinion

## Industrial demand picks up

BY DAVID FREUD

INDUSTRIAL DEMAND is picking up on a broad front, according to two surveys released today. Companies remain uncertain how long the recovery will be sustained.

Manufacturers' order books were stronger in May than throughout last year, says the Confederation of British Industry's monthly trends survey.

The finding is supported by the Financial Times Business Opinion Survey, which charts a further rise in new orders. The FT survey found that businessmen were less inclined to expect further increases in their order books in the next 12 months than they were earlier in the year.

The CBI says that the improvement in order books "no doubt" partly reflects some catching-up from the dislocation earlier in the year.

The recovery was spread broadly across all manufacturing industry, though the consumer goods sector reports the strongest demand.

In line with the increased demand, the CBI reports a small improvement in manufacturers' expectations for output volume in the next four months. Expectations are still below those of last December.

The FT survey found a sharp improvement in confidence among businessmen both over prospects for the economy and for the general business outlook, due mainly to the Conservative victory in the general election.

The index covering labour requirements moved to its lowest point for two years, with companies showing less concern over the effects of employment legislation in plans to reduce labour.

The survey comments that this is exactly the trend one would expect under the Tory Government's policy. "The present shift of opinion may of course simply be due to a number of respondents' awareness of this fact."

The index suggests that industry expects wage costs to rise faster in the next 12 months, though smaller increases in unit costs were expected than previously.

Despite this the index covering the expected level of profit margins continued the decline of the previous two months, with customer resistance to price increases and difficulty of securing productivity improvements among the reasons given.

Details, Page 22

## Weather

**UK TODAY**

RATHER CLOUDY with outbreaks of rain. S. N. England, Midlands, E. Anglia, Channel Islands. Cloudy, thundery showers, heavy in places. Some bright spells. Max 24C (75F).

S.W. England, S. Wales. Rain, some thunder. Brighter later. Max 21C (70F).

N.W. England, Lakeland, N. Wales, Argyll, S.W. Scotland, N. Ireland, Isle of Man. Cloudy, some rain and thunder. Bright intervals. Max 21C (70F).

N.E. England, Borders, Edinburgh and Dundee. Dull with fog patches. Sunny intervals. Thundery showers later. Max 22C (72F).

N.W. Scotland, Glasgow, Cent. Highlands, Aberdeen, Moray Firth. Sunny periods. Thundery showers later. Max 20C (68F).

N.E. Scotland, Orkney, Shetland. Sunny intervals. Coastal fog patches. Max 17C (63F).

Outlook: Cloudy with rain in places, becoming brighter and drier from the West.

Y'day	Today	Y'day	Today
midday	midday	midday	midday
Glasgow 25	26	Lisbon 23	25
Aldershot 25	26	London 23	25
Birmingham 25	26	Madrid 23	25
Belfast 25	26	Moscow 23	25
Berlin 25	26	Nairobi 23	25
Bombay 25	26	Paris 23	25
Buenos Aires 25	26	Rome 23	25
Calcutta 25	26	Sydney 23	25
Cairo 25	26	Tokyo 23	25
Cardiff 25	26	Zurich 23	25
Chicago 25	26		
Cologne 25	26		
Cononagh 25	26		
Dublin 25	26		
Edinburgh 25	26		
Faro 25	26		
Havana 25	26		
Jersey 25	26		
London 25	26		
Luxembourg 25	26		
Lyons 25	26		
Manchester 25	26		
Madrid 25	26		
Moscow 25	26		
Nairobi 25	26		
Paris 25	26		
Rome 25	26		
Sydney 25	26		
Tokyo 25	26		
Zurich 25	26		

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